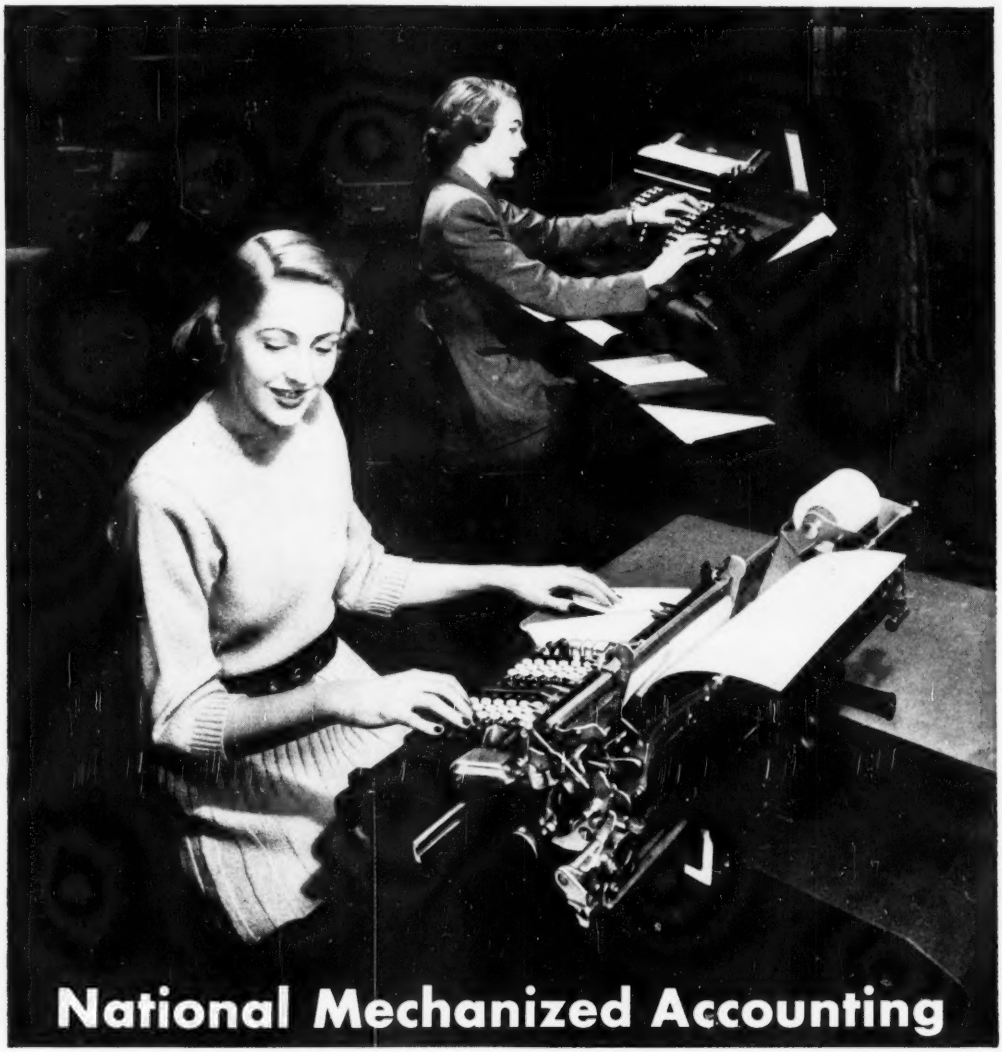
COAL MINING

"The Picture-Book of the Industry"

JUNE 1949 VOLUME XXVI, No. 6

A street in the coal mining community at Nemacolin, owned and operated by the Youngstown Sheet & Tube Company. Miners' houses all have baths, electric refrigerators and heaters.



National Mechanized Accounting

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These two National machines provide a *complete* industrial accounting system. Some companies can handle their entire accounting, including payroll, on the National Multiple-Duty Accounting Machine shown in the foreground. Others find the National Payroll and Distribution Machine essential for a higher production schedule.

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The McCarthy Coal Drill.

The McCarthy Coal Drill provides a fast, new method of mining extra tonnage from workings where overburden expense prevents further stripping. This economical, new Drill soon pays for itself; with augers of 12, 16, 20, 24 or 30-inch diameters, as much as 80% of the coal can be removed to any reasonable depth.

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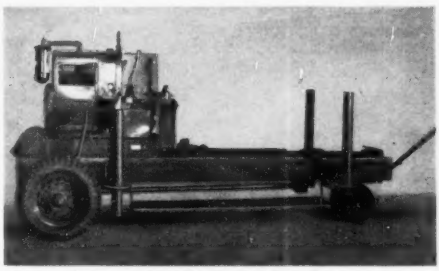

The McCarthy Self-Propelled Horizontal Drill.

For fast production and easy operation, you can't top a McCarthy Vertical Drill. Using McCarthy equipment, 8-inch holes have been drilled 100 feet deep—in only 40 minutes! The derrick is quickly raised and lowered by hydraulic power, and a 60 H.P. gasoline motor is part of the standard equipment. Note, too, that all McCarthy Drills can be equipped with electric motors.

Get the complete story on the time-saving, money-saving McCarthy Drills by sending today for the new Salem Tool Booklet.

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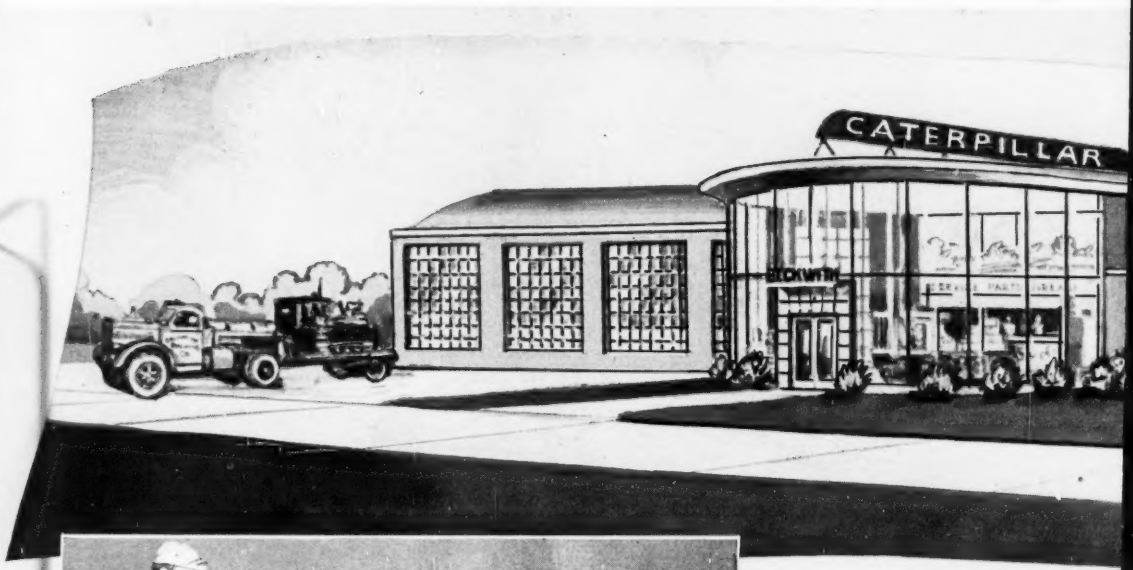

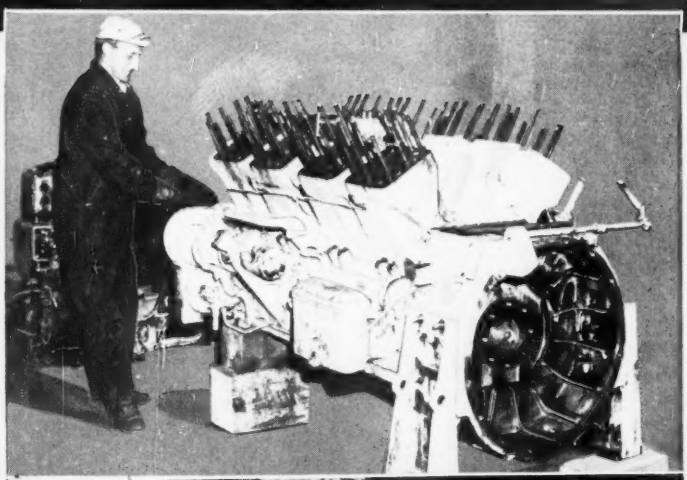

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Thousands of "Caterpillar" parts right at hand to furnish Beckwith customers in this area.

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Beckwith's new Clearfield Branch Building will open officially but without formal ceremony on Friday, July 1st to mark a "new day of service" for equipment owners in the Clearfield area.

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One of the ways to handle every job at its best and lowest ultimate cost is to depend on capable Beckwith service—in parts—repairs—and sales.

Stop in and see our new facilities. Consider how they can be made to work profitably for you.

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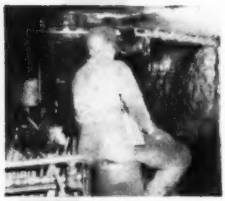

TOP CUTTING

Kennametal bits on this Jeffrey 29-C average 1,163 20-foot places before they are replaced.

Summary of Savings with this bit as reported by Romeo Silvester, Mine Supt.

Mine production between Sept. 29, 1947 and Apr. 4, 1949-558,261 tons

Number of bits used—
1000 Kennametal U-7's

Total bit cost—
1000 x $1.15 $1150.00

Bit cost per ton—
$1150.00 558,261 tons—$.0020

Number of places cut before bits are changed—
Conventional, 5
Kennametal, 64

Time saved on bit changing—92%

KENNAMETAL U-7's

Reduce Bit Cost to $.0020

at Norton 2 mine, West Virginia Coal and Coke Corporation

Romeo Silvester, superintendent of the mine, says, "We have used Kennametal U-7 Bits for almost two years. They have saved us money on sharpening, and bit changing. They have made a tremendous reduction in our bit cost per ton." Bit cost at Norton 2, figured over a period of nearly two years, is $.0020 per ton. Many of the Kennametal U-7 Bits figured into this cost are still in service. "When these bits are worn out completely," says Mr. Silvester, "our cost will be even less." Savings in terms of lower bit cost, lower sharpening cost, and less bit changing are typical of how dependable, long-lived Kennametal bits reduce cost, increase profits. You, too, can take advantage of these features.

Why not get in touch with us today? Mining Division, Kennametal Inc., Latrobe, Pa.

- **Longer Bit Life**
- **Less Bit Changing**
- **Lower Bit Cost**
- **Faster Cutting**

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COAL MINING

Vol. XXVI June, 1949 No. 6

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COAL CUTTER AND DRILL BITS

GREATER TONNAGE PER BIT · QUICKER BIT CHANGING ·
· MORE FOOTAGE PER GRIND ·
MAXIMUM OPERATING SPEED · LOWER POWER CONSUMPTION ·
FIRTHITE
McKEESPORT, PA.
· FEWER BITS PER NUMBER OF CUTS · LONGER LIFE ·

Better because Firthite bits have tougher carbide to withstand the severe service of high production cutting and drilling. Keener edges for cleaner kerf—less dust. Thicker tips for positive cutting and longer wear.

Faster because Firthite bits are skillfully designed to cut *freely* and speedier. Firthite tips are made of harder carbide that retains keen cutting edges over longer periods of time—means less "down-time" for bit changing.

Cheaper because Firthite bits reduce "bit costs per ton" to record low costs in comparison with any steel or other carbide bits. High speed free cutting with Firthite drill bits minimizes power consumption and machine maintenance.

FOR CONVINCING PROOF SEE NEXT PAGE!

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STEEL & CARBIDE CORPORATION
MINING DIVISION
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2/10 of a cent* PER TON

No coal cutting requirements are the same — conditions vary with every mine — location, depth of seams, etc. Let a Firthite Sales Engineer show you what can be done in *your* mine.

HERE'S THE *proof.*

A Mine in the Eagle Seam

Drilling Bit Costs—*less than 12 cents per 1000 feet.*

Six places per day drilled producing 12 tons of coal per place—total places 1800—total tons, 21,600.

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Tough, abrasive cutting—Cost—*2 tenths of a cent per ton.*

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38 Firthite Bits made 50 cuts per grind—production 800 tons per day. *Bit Cost—less than 2 tenths of a cent per ton!*

Get the details on how Firthite Coal Mining Bits can help you mine coal—Better, Faster and Cheaper. Send the coupon NOW.

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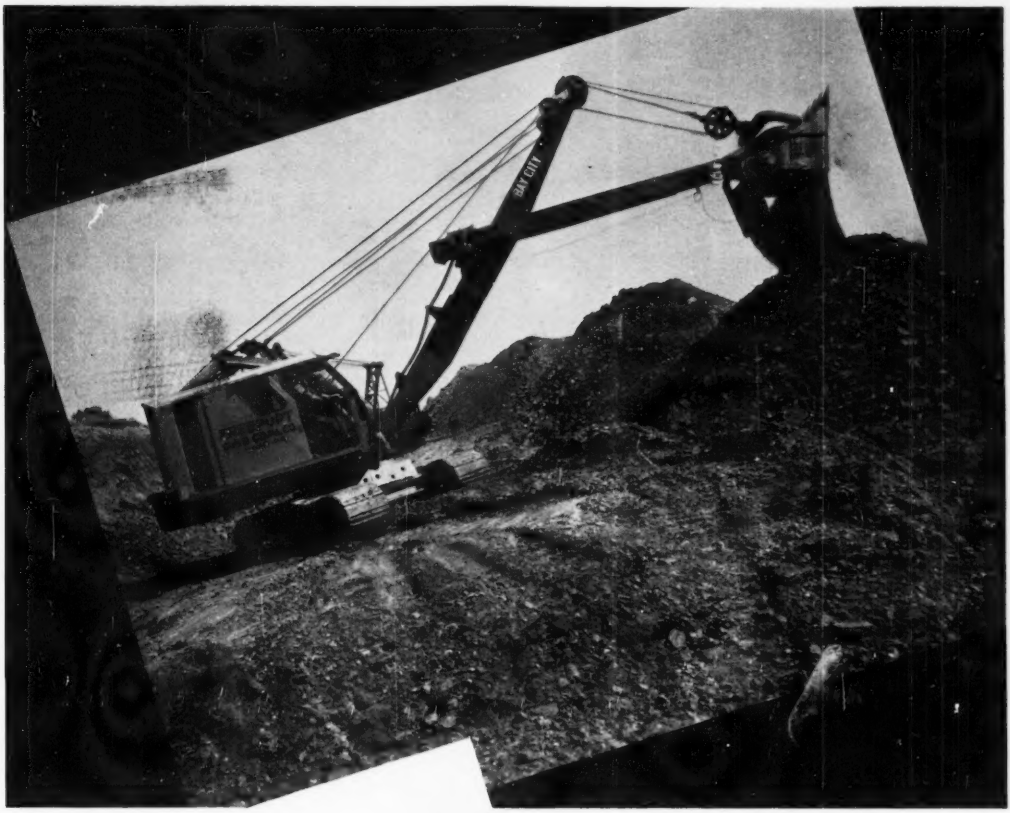

FAST STRIPPER WITH A BIG DIPPER . . . BAY CITY 65

Strip mine owners find that overburden presents no problem when there's a BAY CITY 65 on the job. This 65 working an Ohio strip mine near Coshocton is equipped with 25' boom, 20' stick and 1 1/4 yard dipper to get wide working ranges and long reach. Like all BAY CITY machines, the 65 is built to last and has **all** the advanced engineering refinements . . . tandem drums on separate shafts . . . quiet helical gears . . . quick, responsive control clutches . . . unit-cast alloy steel base. The 65 is a shovel that will give you your money's worth in speed, power, and durability . . . and will save you money on operating and maintenance costs. Why not put one to work for you? Write, wire, or phone for complete facts.

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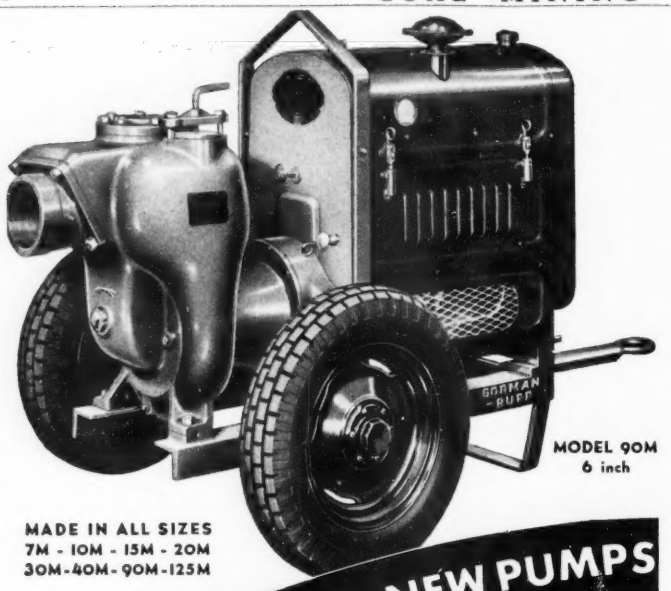
BAY CITY SHOVELS INC., BAY CITY, MICHIGAN See your nearest Bay City dealer for excavating and material handling equipment in sizes from ⅜ to 1¼ yard with crane rating up to 20 tons. Both crawler and pneumatic tire mountings.



MODEL 90M
6 inch

MADE IN ALL SIZES
7M - 10M - 15M - 20M
30M-40M-90M-125M

GORMAN-RUPP'S NEW PUMPS

CHALLENGE ANY PUMP TO MATCH THEIR PERFORMANCE

With a new complete line of Contractors' Pumps, Gorman-Rupp has topped their own past high record of performance with a better pump --

-- QUICKEST PRIMING
-- HIGHEST PRIMING
-- PUMPS MORE DIRTY WATER

Compare them for priming speed:

The new Model 15M (3") primes at 25 ft. suction lift in 61 seconds.

The new Model 90M (6") primes at 25 ft. suction lift in 44 seconds.

And the Gorman-Rupp is still the most simple pump --

No ports, no valves, no clean-out plates, nothing to cause stoppages.

Write for the new Contractor's Bulletin 8-CP-11

THE GORMAN-RUPP
Guarantee

Our distributor's are authorized to put a Gorman-Rupp Contractor's Pump on any pumping job, anytime, anywhere, alongside any other make pump, size for size. The Gorman-Rupp pump is guaranteed to pump more dirty water, more hours, using less gasoline, to prime quicker and at higher suction lifts than any other self-priming pump. If it isn't the best all around pump, our distributor will accept the return of the Gorman-Rupp pump and pay the user any installation expense incurred.

THE GORMAN-RUPP COMPANY
MANSFIELD, OHIO

IMMEDIATE DEVELOPMENT OF SYNTHETIC FUEL PLANTS ESSENTIAL TO ECONOMIC WELFARE AND MILITARY SECURITY U. S. BUREAU OF MINES OFFICIAL SAYS AT ASME MEETING

Immediate development of synthetic fuel plants is essential to the economic welfare and military security of the United States, W. C. Schroeder, chief of the Office of Synthetic Liquid Fuels, Bureau of Mines, U. S. Department of the Interior, said at the Annual Meeting of The American Society of Mechanical Engineers. Mr. Schroeder, who addressed a fuels luncheon, stated that the current demand for petroleum has reached "awesome proportions" and still is rising.

"Anticipated military requirements for any future war seem almost astronomical. Traditional wildcating and geophysical exploration, which have met the need in the past, no longer provide the assurance that demands of the future will be met."

Petroleum and its products being indispensable to the United States, the sources of our future supply are vital problems, he continued. "Basic decisions must be made—and soon—by the American people, by industry and by the Congress."

After analyzing the present and future demand for liquid fuel, he stated that in order to meet the anticipated civilian requirement, an additional 1½ to 2 million barrels a day will have to be obtained. He pointed out that it would be unwise to become dependent upon foreign sources, and said:

"Synthetic oil from coal and oil shale offers an assured supply for hundreds of years within the borders of the United States—self sufficiency in peace or war. Synthetic fuels can fill the gap between anticipated demand and supply, but only if immediate steps are taken to establish commercial plants.

"The time, manpower, and materials required for a synthetic fuels industry adequate to produce 2 million barrels a day preclude consideration of its establishment as an emergency measure—an industrial mobilization 'Plan X' to be plucked out of the 'top secret' file and put into execution over night. Instead, like other basic industries, it must start now and develop gradually over a period of years as the need and demand for its products increase."

(*Continued on Page* 40)

SCHROEDER BROTHERS

PITTSBURGH 1, PENNSYLVANIA

Announces Air And Electrical Equipment

Complete Roof Bolting Service

THE CLEVELAND SIIS STOPER

FOR **HIGH** OR LOW

Coal Seams

THOR — IMPACT WRENCHES

Quick Delivery
Lowest Prices
on
Bolts - Wedges
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WRITE
WIRE
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For Demonstration

EXpress 1571

ACME TRACK & RUBBER MOUNTED COMPRESSORS

Acme can make prompt delivery of your compressor needs regardless of size or mountings—Write, Wire or Phone.

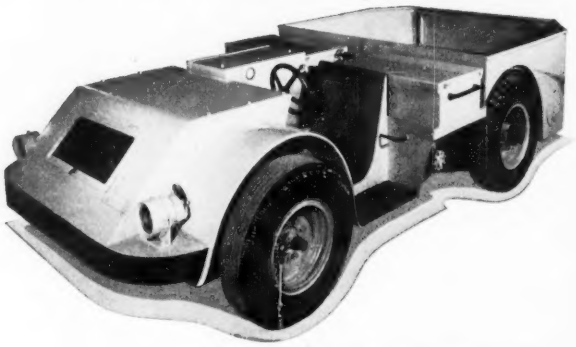
The Acme Model 105H Rubber Tired Compressor delivers 105 CFM at 100 pounds pressure and is designed for 24 hours around the clock drilling — 30" Overall Height — 6" Ground Clearance.

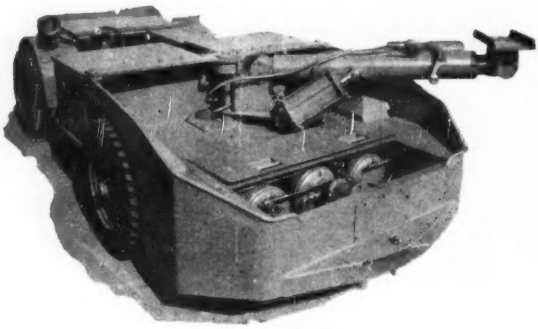
SCHROEDER BROTHERS - PITTSBURGH PENNSYLVANIA

NOW—THE RJI "MINE JEEP"

is fully equipped for 5 Complete Operations!

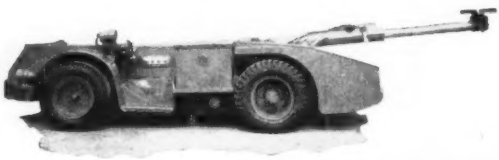
Here is the all round service unit for your trackless mining systems





TIMBER BOOM

Telescoping timber mounted on rear platform.
Operated by two air lifting cylinders
Self leveling timber head
Swing 55° to each side of center
Hand swing with automatic air brake stop
Hand operated telescoping and 36" extension



1 UTILITY TRUCK
For handling supply and materials needed for operating and maintenance crew.

2 MINE TRACTOR
For pulling rubber tired trailers, with timber and other supply, also to pull miscellaneous equipment such as rock dusters, air compressor units, etc.

3 GREASE & SERVICE UNIT
Fully equipped with air operated oil and grease guns for complete lubrication of mining machinery at the working face.

4 TIMBERING MACHINE
Equipped with air operated timbering boom and power driven timber saw

5 POST PULLER
Four speed transmission gives power and speed for pulling post.
Can also be equipped with electric driven winch.

GENERAL DIMENSIONS

Overall height	36"
Overall width	76"
Overall length	14'-7"
Wheel base	80"
Timber boom-Max. height	8'-6"
Timber boom-Max. Swing	55° each side of center

Please write for bulletin and complete information.

Lee-Norse Company
CHARLEROI PA.

Here and There in the Coal Industry

The Colorado School of Mines at Golden is presenting a new course in coal mining engineering. This is in line with suggestions previously made by the NCA Department of Mining Engineering Education. First announcement of that course is made in the 1949-50 catalog. Professor Keenan, a graduate of the Colorado School of Mines, who taught last year at Penn. State College after returning from Germany, where he had a part in the supervision of coal mines, is in charge of the course. There are 1,126 students at the Colorado School of Mines, all taking the same courses for the first two years. Twelve juniors and five sophomores are enrolled in the course.

J. William Wetter was elected President of The Central Pennsylvania Coal Producers' Association and of the Eastern Bituminous Coal Association at a joint meeting of the Boards of Directors in Philadelphia, Friday, April 1. He is President of the Rockhill Coal Company, Philadelphia.

T. F. McCarthy, Vice President of the Clearfield Bituminous Coal Corp., Indiana, Pa., was elected Vice-President of The Central Pennsylvania Association, and W. H. Naylor, Vice-President of the Davis Coal and Coke Company, Baltimore, was elected Vice-President of the Eastern Bituminous Coal Association.

Mr. Wetter has long been associated with the bituminous coal mining industry and has served as a Director of The Central Pennsylvania Association for nearly 30 years and of Eastern Bituminous Association since its organization in 1933. His active mining career began in 1903 and since that time he has been officially connected with several companies in that district. He has also served under several governors as a member of the Pennsylvania Bituminous Mine Inspectors Examining Board and in 1930 he became President of the Rockhill Coal Company.

The functions of these associations cover many activities in connection with coal production and marketing, the Central Pennsylvania unit being solely responsible for labor negotiations and problems, while the Eastern Bituminous Association is primarily responsible for freight rates.

The joint Boards appropriated $25,000 to St. Francis College at Loretto, Pa., as a memorial to their late and beloved president, Charles O'Neill.

Added impetus was given recently to young high school and college students who hope to seek careers in Americas coal industry, by the announcement that *Lewis W. Howells, Jr.*, student at Lehigh University, *John C. Scott*, Jr., a freshman at West Virginia University, received the two $300-per-year scholarships granted by the Coal Division of AIME.

The purpose of the scholarships, which can range up to $625 a year, is to develop trained men for this essential industry, and to foster better employer-employee relations.

The Honorable Richard Maize.

The Honorable Richard (Dick) Maize, Secretary of Mines, Commonwealth of Pennsylvania has recovered from an illness and is back on the job. Here he is discussing a mining problem at a recent meeting of the Pittsburgh Coal Mining Institute.

Mr. Howells was born in Norristown, Pa., and attended South Whitehall Township High School, from which he graduated in 1947, third in a class of 68 students. He entered Lehigh the same year, placed in the top fifth of his class. The hard-working lad did his summer surveying work, assisted with his home farm work, and was also employed as a truck driver with the New Jersey Zinc Co.'s shaft sinking operation near Bethlehem, Pa., last year.

At Lehigh, he is a member of Pershing Rifles, national honorary military society of R.O.T.C.; the Howard Eckfeldt Mining and Geological Society, an affiliated Student Society of AIME.

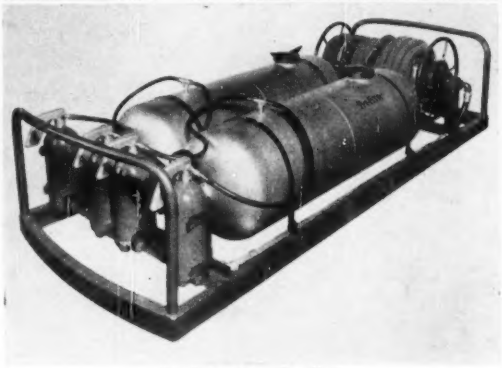
John Scott was an honor roll roll student at elementary and high school, entered West Virginia University in 1948, majoring in mining engineering. A star athlete, he has his high school letter in football and basketball, was president of his class, student council member and valedictorian, but still found time to serve as a junior deacon in the Christion Church. His father is employed by the New River Co., Mount Hope, West Virginia.

The scholarships these ambitious students have won also provide a provision for summer-vacation employment, as well as the financial aid in their studies. The full story of their awards, and careers thus far, appears in the March issue of *Mining Engineering*, official AIME publication, which also carries, in this, the annual issue, a thorough review of the past year's developments in all branches of mining.

The Coal Division, noting an ever-increasing interest in that branch of mining among students and colleges, is making plans to grant further aid to young men like Howells and Scott, who are coming up fast from the schools to the universities, and will be an integral part of Americas industrial future.

Edward M. Sheehan, well known Pittsburgh business man died Sunday evening, May 29th, at Pittsburgh Hospital following a heart attack at his home.

Mr. Sheehan, a native of Plain City, Ohio, was 58 years of age. He was President of the Motive Parts Company of Pennsylvania, a business founded by he and his brother Raymond, 27 years ago. He was very well known throughout the automotive and industrial world.



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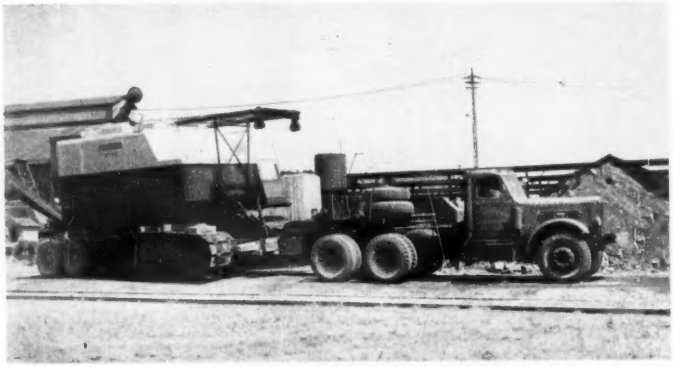

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DO YOU KNOW . . . ?

Medals are being handed out to squash, lima beans, lettuce, radishes, cauliflower and sweetcorn. These new vegetables, winners of the All-America Selections awards for 1949, may be grown in your own garden this spring.

Caserta summer squash, light yellow with irregular green stripes, wins the first Gold Medal given for vegetables in over a decade. Just a few plants will supply a family with squash over a long season. Developed by Dr. Lawrence C. Curtis of the University of Connecticut experiment station, it is of the summer bush type.

The coveted Silver Medal goes to the Triumph bush lima bean, which produces the finest quality butter beans available throughout the whole country. Especially tasteful fresh from the garden, Triumph is great for canning and freezing and it is valuable for dry or shelled beans. Drs. Roy Magruder and Robert E. Wester, U.S. Bureau of Plant Industry, are responsible for this achievement.

Two heat-resisting head lettuce varieties, both developed by Prof. M. T. Lewis of Penn State College, receive Bronze Medals. Premier Great Lakes lettuce is resistant to tip-burn. Trials produced over 90% of choice marketable heads in summer, an outstanding record. This lettuce matures about a week earlier than its co-winner, Pennlake lettuce. Strongly resistant to heat and tip-burn Pennlake lettuce makes a smaller head that fits conveniently into the refrigerator.

Cherry Belle radish, also a Bronze Medal winner, grows into round globes of the brightest red. It is crisp and firm at all stages.

Easy to grow, Ideal Snowball cauliflower produces beautiful big heads or curds which hold for days without ricing or granulation. Flagship hybrid sweetcorn provides bigger ears on stronger stalks, even under adverse weather conditions. Both of these receive Honorable Mention.

Seeds of all these vegetables, destined to soon replace many of the older favorites, may be obtained conveniently through any reliable seed house. They should be ordered early, however, if you want to be sure of a supply this first season.

* * *

Roofing paper, covering the soil under a basementless house, helps keep the moisture low in the crawl-space between floor and earth and decreases danger of timber rotting and iron rusting. It lessens the need for crawl-space ventilation, thus making it easier to keep the floor warm.

This is the finding of the U.S. Department of Agriculture after extended observations. Heavy roofing paper is recommended by it. With properly covered soil, the crawl space was often found dry enough to be used for storing garden tools, lawn mowers and lumber.

"Sweating" or condensation of moisture has not been found in a single case where this precaution was taken, Dr. J. D. Diller, a Department forest pathologist, stated. This means protection not only for the lumber in the structure but against rusting of steel, deterioration of insulating materials, buckling of floors, and the short-circuiting of electric wiring that sometimes occurs in moist spaces.

* * *

The ends of broken bones must be in contact and under compression if they are to unite into one strong bone again.

Microscopic studies showing this were reported by Drs. G. W. N. Eggers, Thomas O. Shindler and Charles M. Pomerat, of the University of Texas School of Medicine at Galveston, at the meeting here this afternoon of the American Academy of Orthopedic Surgeons.

Surgeons treating patients with broken bones can make use of these findings, which were made on rats, by applying the longitudinal compression forces of the patient's muscles, Dr. Eggers pointed out.

In the studies the Texas group examined under the microscope thin slivers of bones of rats that had been broken and then set.

"The bones which were under contact and compression united and the margins which were not under compression and contact did not unite," Dr. Eggers reported.

The work, he said, is "related to the basic fundamental physical principle which underlies the stimulation of osteogenesis (bone formation) and the healing of bone injuries. This experiment indicates a physiogolic response to physical requirements to which bones are exposed."

* * *

James W. Bristow, Secretary and Treasurer of the Illinois Coal Strippers Association died April 13. For the past eleven years Mr. Bristow devoted a great deal of his time to improving relations of coal strippers and the public with respect to land reclamation.

* * * *

A search for 800,000 Americans who are going blind without knowing it is getting under way. Object is to get these people to eye specialists for treatment that can save the eyesight of most of them if started in time. Spearheading this search for blindness in order to stop it is the National Society for the Prevention of Blindness which held its 40th anniversary conference here.

The 800,000 future blindness victims are those suffering from the eyeball hardening condition known as glaucoma. The number is an estimate based on a recent test study.

Among 256 employees of a Philadelphia department store recently examined, 28 had enough tension in their eyeballs to make the doctor suspect glaucoma was present or coming on and six were definitely diagnosed as having glaucoma. Dr. Solomon S. Brav of the Jewish Hospital, Philadelphia, reported here.

Waiting for patients to notice symptoms and come to the doctor is too slow to save many from glaucoma-caused blindness, in Dr. Brav's opinion. He believes there should be routine eye examinations of people aged 40 and over, something as unsuspected tuberculosis and cancer cases are now being sought through routine examinations of people in the age groups most likely to be affected.

The eyeball is not elastic. It is kept normally firm by nervous system regulation of the constant entrance and exit of fluids into it. In glaucoma this delicate mechanism is upset. The exit channels get blocked and back pressure results. Measurement of the tension produced gives the doctor a clue to whether glaucoma is present or likely to develop.

Searching for glaucoma is difficult because early symptons and signs are indefinite. First signs that the patient himself might notice are attacks of fogged or blurred vision. He may see rainbow halos around lights at night. Such a sign should be reported to the eye physician at once. Second important warning sign is pain, which may seem to range from a feeling of fullness in the eye to what seems an ordinary headache. Fairly often the pain spreads through the head and there is nausea and vomiting with it. This may be mistaken for a "bilious attack," and the pain around or in the eyes may be wrongly considered due to sinus trouble.

Third important sign is a feeling that the reading glasses need changing. Since glaucoma usually comes at middle age, when people are needing reading glasses anyway, this feeling that the glasses need changing may be misunderstood. If the patient asks to have his glasses changed every few months instead of every two years or so, glaucoma should be suspected.

* * * *

Aureomycin, one of the newest antigerm remedies from a mold, has proved to be the best drug so far available for the malignant form of undulant fever.

Prompt improvement in every one of 24 patients after getting the golden yellow mold drug is reported by Drs. Wesley W. Spink and Abraham I. Braude of the University of Minnesota Hospitals and Medical School and Drs. M. Ruiz Castaneda and Roberto Sylva Goytia of the Mexico General Hospital, Mexico City, in the Journal of the American Medical Association.

A combination of streptomycin and sulfadiazine had previously proved effective in treatment of undulant fever in the United States. But when tried in Mexico, where thousands of persons are victims of the disease, the sulfa drug-streptomycin combination did not work so well. In the Mexican patients the disease was caused by a different strain of undulant fever germs, Brucella melitensis, which are much more malignant than the Brucella abortus germs, against which the sulfa-streptomycin treatment was effective. The streptomycin-sulfadiazine treatment has also the disadvantage that it must be given in a hospital, since the streptomycin must be given by hypodermic injection.

Aureomycin can be given by mouth. Patients can take it at home without being in bed. It causes only slight side-effects, whereas streptomycin in large doses causes disturbances of the balancing mechanism in the ear and even deafness.

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Main hoisting shaft and washing plant at the Nemacolin Mine. Building on right houses power generating equipment.

NEMACOLIN ... *The Coal Mine Beautiful*

Man blandly accepts his body as the supreme mechanical and chemical marvel of all time. Man's body, however, is a patch-up job, insecurely tied together by muscles and tendons and is full of imperfections, weak spots and organs that were needed at one time but which are entirely unnecessary to present-day living.

Ever since man's ancestor dropped from a tree some 500,000 years ago and hoisted himself to his hind legs his physical troubles have never ended. Standing on his two hind legs gave the human animal a tremendous advantage over his enemies. It gave him two hands to fight and work with—gathering food and building shelter. It made his mind race ahead and enabled him to climb the evolutionary ladder three steps at a time. But his body development did not

Back yards of two of the miners houses

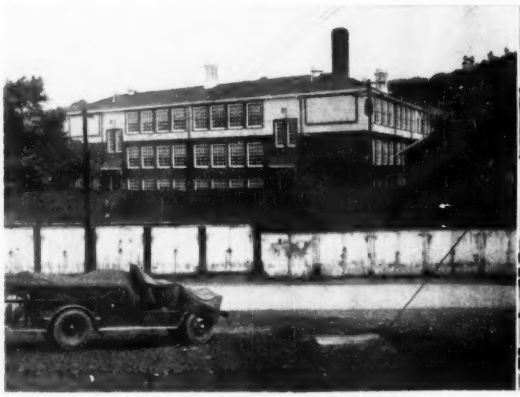
Overall view of some of the town of Nemacolin.

Shaft bottom of the Nemacolin mine — looking outby from the production end.

World War II Honor Roll and town theatre.

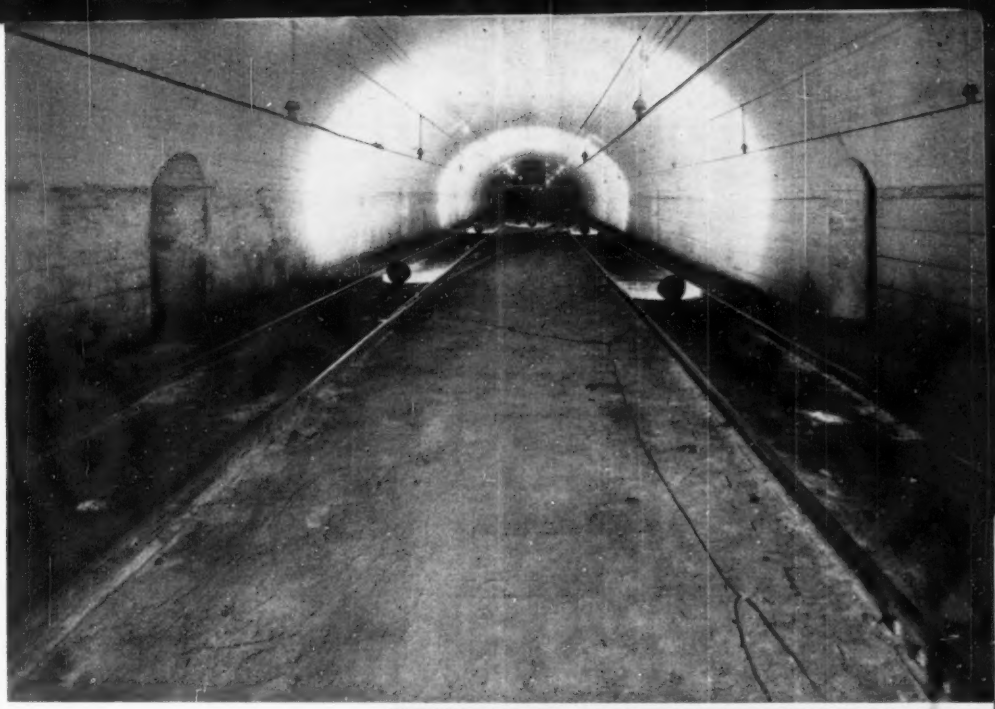
keep pace with the development of his mind, for man's spinal column is not strong enough to carry the tremendous weight it must carry in an upright position so it sags and bends. Man's feet were meant to carry only half the weight of the body and often breaks under the full weight. Organs in his abdomin press down on the pelvic area, tear membranes supporting them, producing rupture.

Standing on two legs man also had to learn to sit down but has very little to sit on. Half a million years of standing has not been long enough to let him develop a satisfactory rear end assembly for comfortable sitting. Stresses and strains on the back due to bad posture brought on by the lack of better sitting equipment cause



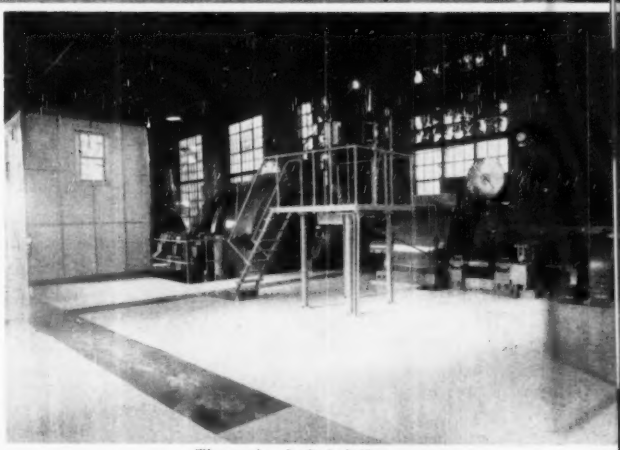
Public school in the town of Nemacolin.

Doctor and nurse in the mine hospital.



Another view of the shaft bottom —looking out by beyond the part shown in picture on opposite page.

a great deal of the low back pain that has plagued the human race. The coccyx—end of the spinal column—which is the remains of a tail once sported by some of man's ancestors serves no purpose today and is a source of trouble by setting up areas of pressure and irritation. Another unnecessary organ in man's body is the appendix which primitive man probably needed to digest the courser food he consumed. As man's food became more refined his intestines shrank, leaving the appendix reduced in size and activity. The pineal gland, a bit of reddish-gray, cone-shaped tissue located on the roof of the brain has no function whatever today and modern researchers guess that it is the rudimentary remains



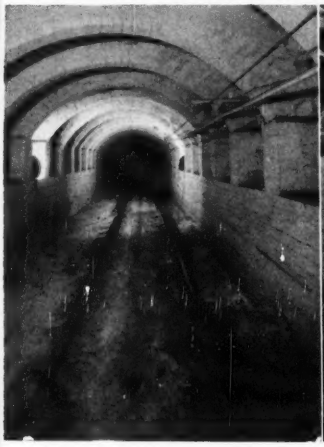
The main shaft hoisting room.

Underground offices of the dispatcher, the mine foreman and the assistant mine foreman.

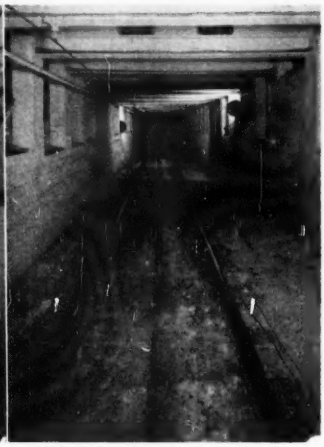
Inside the office of the dispatcher. Femco trolleyphone unit is temporarily placed on a chair.

Talking into the Femco trolleyphone from a main line locomotive.

Lee-Norse Jeeps are used for fast transportation underground.



Brick arch timbering in a main haulway.



Straight beam timbering in a main haulway.

Another view of beam timbering in a main haulway.

Heavy beam timbering in a main haulway. Some of these are 18 inch beams.

of a third eye inherited from lower vertebrate ancestors.

Tonsils, present in most animals, cause trouble only to man. Tonsils were apparently designed to trap and to destroy bacteria. In men they trap but do not seem to destroy the bacteria and a red-hot throat follows.

Other organs in man's body could be designed better. The gall bladder has too small a bile duct and it frequently clogs when the bile chemical crystalizes and turns to stone. Many animals get along without a gall bladder and so does man when his gall bladder is removed by surgery after it has clogged too often. Man has many other structural weaknesses. Anthropologists tell us that a new

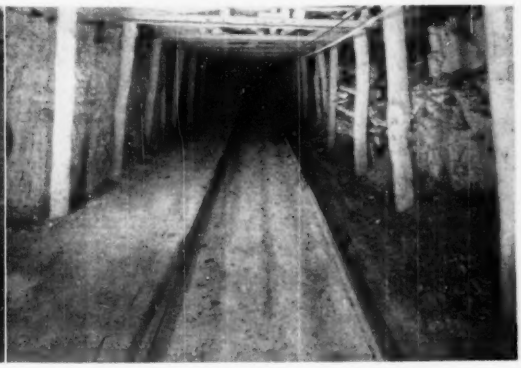
---

The

Back of the beating hammer
By which the steel is wrought,
Back of the workshop's clamor
The seeker may find the thought,
The thought that is ever master
Of iron and steam and steel,
That rises above disaster
And tramples it under heel.

The drudge may fret and tinker
Or labor with lusty blows,
But back of him stands the thinker,
The clear-eyed man who knows;
For into each plow or saber,
Each piece and part and whole,
Must go the brains of labor,
Which gives the work a soul.

Beam timbering in two track haulway.

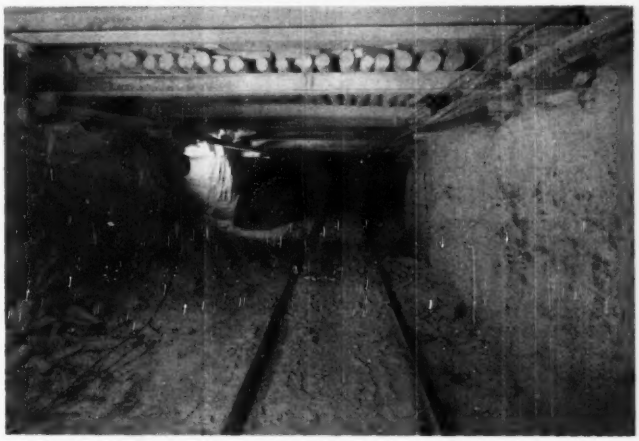


Wood timbering of main haulway in production area.

human body better fitted to modern conditions is evolving. It will take another half million years to evolve anything spectacularly new, however.

The Nemacolin Mine of the Youngstown Sheet & Tube Company was opened on the Monongahela River in Greene County, Pennsylvania, in the year 1917. At the time of its opening the Nemacolin Mine was the most modern coal mine to that date. Recently, or more than 30 years after its opening, an International Board of Judges, sponsored by the United States Navy, judged the Nemacolin Mine the finest coal mine in the world.

In keeping with a policy of doing



Rock dusted haulway in the production area. Note: all haulway pictures shown were taken as they were found. No cleaning up was done for pictures.

Thinker

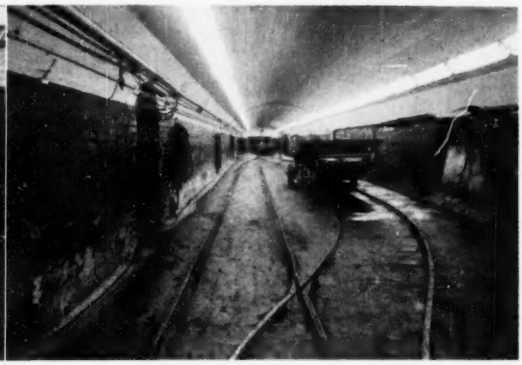
Back of the motor's humming,
Back of the bells that sing,
Back of the hammer's drumming,
Back of the cranes that swing,
There is the eye which scans them,
Watching through stress and strain,
There is the mind which plans them—
Back of the brawn, the brain.

Might of the roaring boiler,
Force of the engine's thrust,
Strength of the sweating toiler,
Greatly in these we trust,
But back of them stands the schemer,
The thinker who drives things through,
Back of the job—the dreamer
Who's making the dream come true.

—Berton Braley

One of the 50 I-T-E KSC automatics reclosing circuit breakers which sectionalize the mine power system.

The entire underground repair shop is fluorescent lighted. Roof in this section of the shop has been arched and lights have been placed in the arches, giving a soft evenly distributed light over entire room.



Flourescent lighting in this shop room is out in the open. Light is bright and even throughout the room.

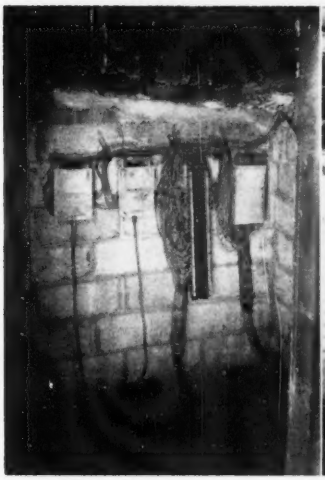
Another flourescent lighted room in the repair shop.

Still another flourescent lighted room in the repair shop.

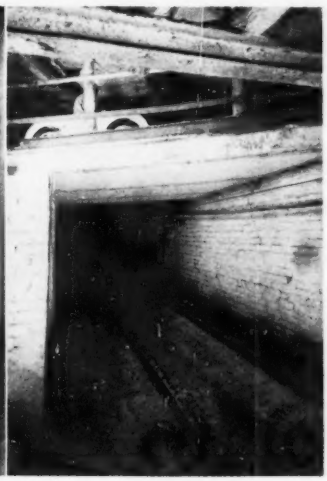
Flourescent lighted parts storage room in the repair shop.

things in the best possible way with the latest type of equipment, this mine installed one of the new Joy Continuous Mining Machines. After thoroughly testing this machine the management is convinced that while it is not yet right, it is a big step in the right direction and is here to stay. Rocks in the crust of this earth, all plant life and all animal life improve with time. Machines are the product of man's mind. Like evolution brought changes in man's body, man's mind will bring changes and perfection of this revolution in coal mining machinery. As Nature made it necessary for man to discard some parts of his body which seemed necessary at first and to strengthen other parts so that he can live better in this modern world, man's mind will likewise simplify the operation of this continuous mining machine by alter-

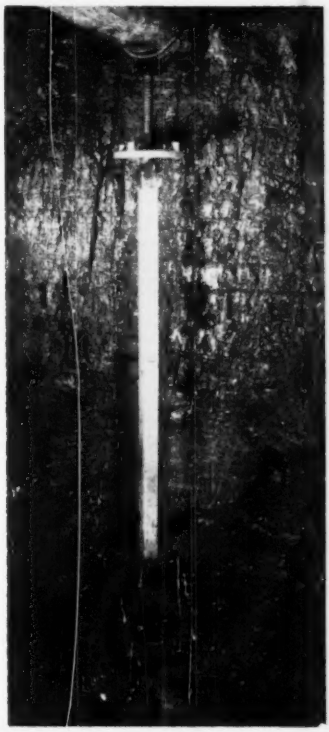
The Joy continuous mining machine at the face. Insert shows the cutting head in position.



26 pair cable outlet for telephones on the 5 miles of main haulways. All cable is buried.

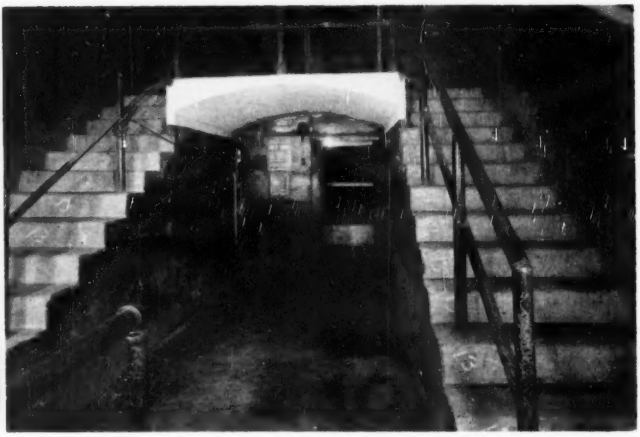


Empty car trip overpass on main haulway.

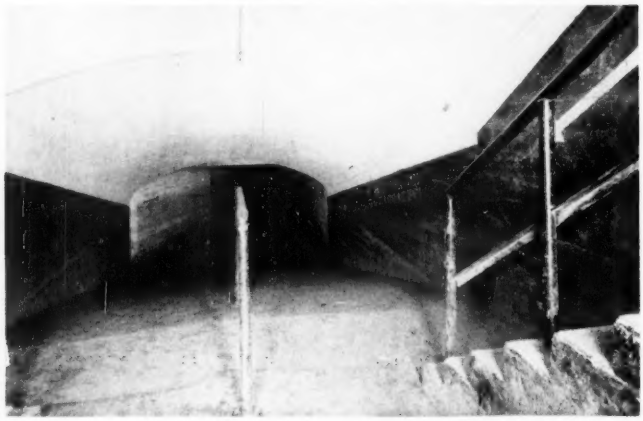


Left: The Star aluminum alloy, light weight safety post and roof jack, is used with the continuous mining machine. Star jacks have a quick adjusting hand wheel which permits instantaneous raising and lowering of the screw, reducing set up time. Light weight permits easy handling thus reducing hand and face lacerations and body bruises.

Building at new man portal, housing emergency hospital, a lamp room and shaft hoist.



Bottom of the man portal shaft, showing landings of the two deck man elevator.



Manway to workings at bottom of the man portal shaft.

ing and strengthening its body, using direct drives and making changes in some of the present parts and discarding some of the unnecessary parts. In time the Continuous Mining Machine will simplify the production of coal for this modern world.

The Nemacolin Mine is producing Pittsburgh seam coal which runs 7 feet thick. The seam is reached by a 250 foot shaft. The output is washed and the coal is used for metallurgical purposes at the Youngstown operations of the Youngstown Sheet & Tube Company.

Production runs 9,000 tons daily. Machine mounted Jeffrey type 56-A drills. Jeffrey Universal cutting machines. Joy 11-BU loading machines and Joy shuttle cars are used in mining the coal. Cutter bits and drill heads are equipped with Kennametal carbide tipped bits. The output is hauled in 7-ton all-steel cars, on 70 pound track. Up to 54 places are worked to produce the 9,000 tons daily capacity with the present equipment. Working area is about 5 miles from the hoisting shaft bottom. All working area is well rock dusted with rock dust by the Carbon Limestone Co. It is the construction and maintenance of the long haulways that makes Nemacolin Mine the Coal Mine Beautiful.

Nemacolin Mine Sectionalization Installation

Nemacolin Mine has one of the mining industry's largest D-C distribution systems, there being ten surface substations in parallel use having a total rating of 4400 K.W. at 275 volts. Main haulage and feeder lines extend over seven miles continuously.

To protect this large D-C network and improve operating continuity throughout the mine, and especially in thirteen mechanized sections some fifty I-T-E Type KSC automatic reclosing circuit breakers sectionalize the system.

These have been applied according to the new Bureau of Mines recommendations for overcurrent protection, thereby making Nemacolin among the first operations to adopt this part of the new code.

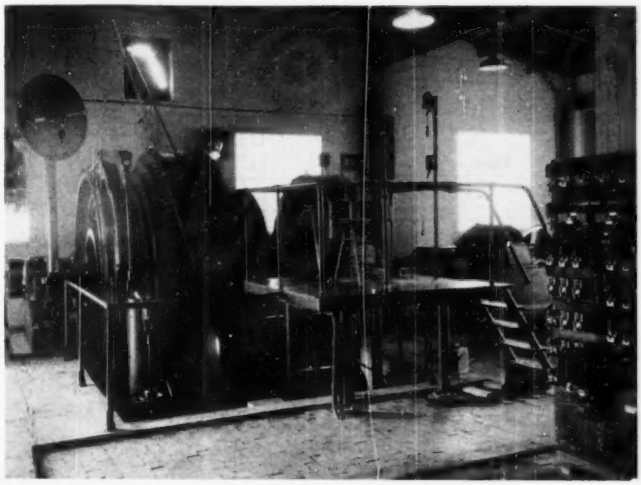
Briefly, a circuit breaker protects each mechanized section, each inby and outby circuit from each substation, and each substation tie line at its electrical center. The main branch

feeders off the substation tie lines are sectionalized also.

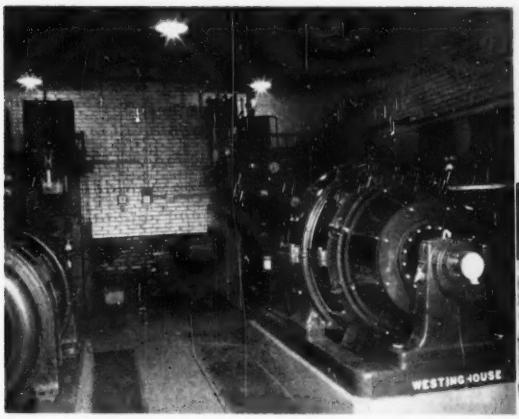
All circuit breakers are housed in simply designed cinder block doorless cubicles. The inby and outby substation circuit breakers are located adjacent to the boreholes from the surface in each instance.

The circuit breakers provide the most advanced form of protection known for fire hazards resulting from fallen trolley wires and feeders; and, at the same time, limit production tieups to the small areas originating them. Both state and federal inspectors recognize the value of this kind of protection for both men and property underground.

A new 485 foot deep man portal shaft was recently put down 4 miles from the hoisting shaft. This new shaft is equipped with modern Con-



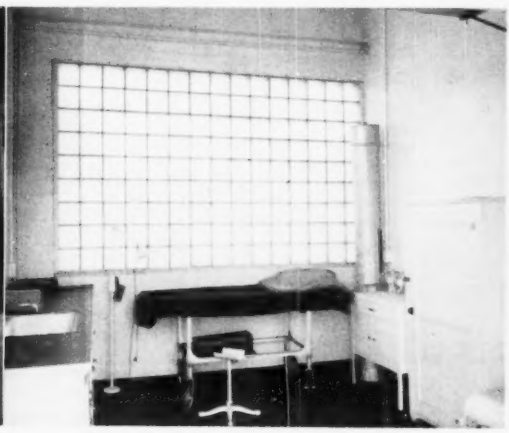
Hoisting engine for the elevator at man portal shaft.



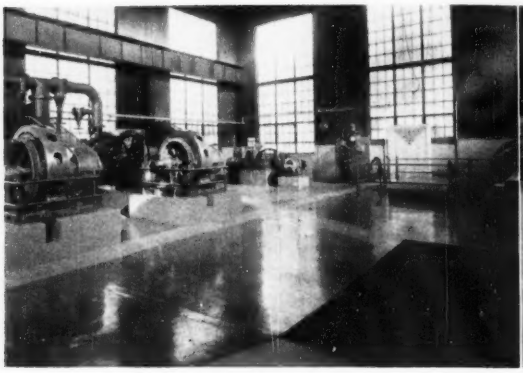
Substation at the man portal shaft.

Joy-Sullivan Axielflow fan at the manway portal.

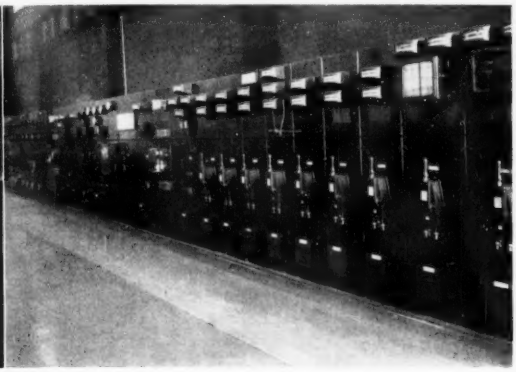
Lamp room at the man portal shaft.



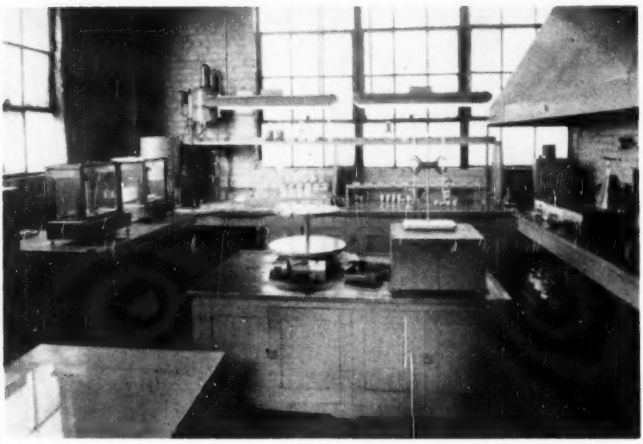
Emergency hospital at the man portal shaft.



Inside the power house at the coal hoisting shaft.



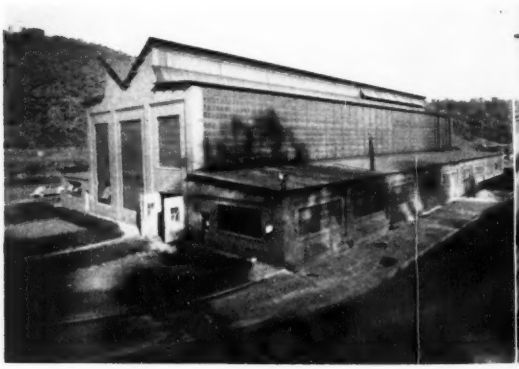
Switchboard at the main power house.



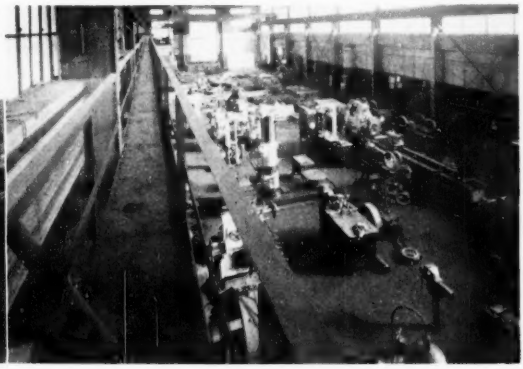
Cleaned coal analysis laboratory in the main power house building.

nellsville double-deck man elevators, each capable of holding 30 men. A substation, a new Joy-Sullivan Axiel-flow fan capable of making 450,000 cubic feet of air per minute, an emergency hospital and a modern lamp house have also been installed at the new shaft.

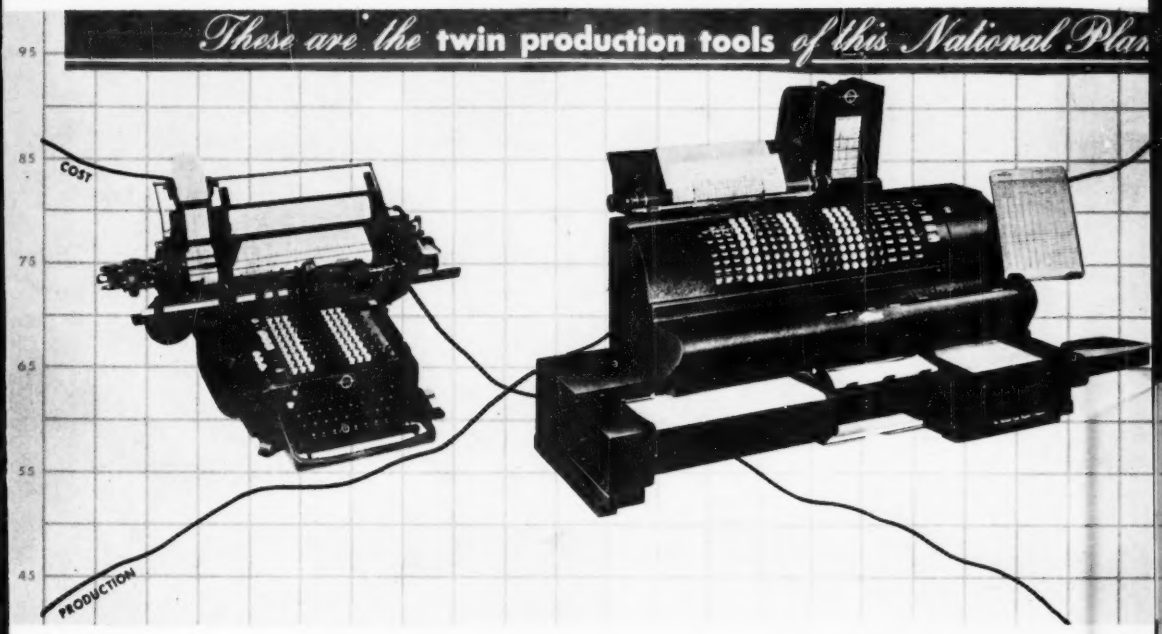
The continuous mining machine at the Nemacolin Mine is the Joy 4-J CM high pedestal type. It is being serviced by 2 Joy 10 SC type shuttle cars. After the continuous mining machine is perfected, 9 of those machines working in 30 places should produce the 9,000 tons of coal needed from a mine like this one. The area required to produce that tonnage should be reduced by 3/5 and the air requirement should not be more than 150,000 cubic feet. Other economies should be in the same proportion.



Outside machine shop at main shaft.



Inside the machine shop at main shaft.



Now—

Mechanized Accounting For The Coal Mining Industry

New Equipment Points Way to Increased Production and Reduced Costs

By GALES A. CRAIG

Coal mines are admittedly the last major industry still using "horse and buggy" methods for producing the necessary accounting records vital to management. Mechanization of coal mines underground in order to increase production and reduce costs is not new: for management has for many years been applying the newest equipment to mine coal. This same management has purchased the latest in cash registers and accounting equipment for their industrial retail stores which is evidence that when better methods are available in all phases of production and accounting, management is quick to adapt it to their advantage. However, the prepa-

STORES LEDGER

PAGE NO. _____

SYMBOL G UNIT 101 BIN NO. 801

MAX 10 MIN. 3

DATE _____ AUTHORITY _____

PURCHASED FROM	ORDER NUMBER	UNITS ORDERED	INV. DATE	DATE RECEIVED	RECEIPTS UNITS	RECEIPTS AMOUNT	DISBURSEMENTS UNITS	DISBURSEMENTS AMOUNT	DATE ISSUED	SYMBOL	DEPT. CHARGED	BALANCES UNITS	BALANCES AMOUNT	PICK-UP UNITS	PICK-UP AMOUNT
									APR 1 49	G	101	8	80.00	8	80.00
							2	20.00	APR 15 49		101	6	60.00	6	60.00
EFFERY	1347	5	4 12	4 18	5	50.00	5	50.00	APR 17 49		101	1	10.00	1	10.00
												6	60.00	6	60.00

EMPLOYEE EARNINGS AND DEDUCTIONS RECORD

MINE_____

YEAR_____

PAY PERIOD A	TOTAL HOURS .01 .02	B GROSS EARNINGS C Blue Cross Hosp. Dr. & Local Hosp.	D .03 Misc. Tax .04 Special Collection E .05 Death Ben. .06 Elec. Power .07 Miscell.	P UN. FEES UN. ASSESS. R UNION DUES	N CASH ADVANCES S S T REAL EST. MORTGE. RENTS	F F. I. C. U COAL PURCHASED	H BONDS J P. M. CO.	L	G W/H TAX TAX TO DATE	GROSS EARNINGS TO-DATE
1	80.00	172.50				1.73	18.75		12.60	$ 172.50
	.01	2.00		2.00	15.00	10.00	87.55		12.60	▽ 172.50
2	88.00	196.55				1.97	18.75	2.00	16.40	$ 196.55
	.02	3.25		2.00	15.00		92.50		29.00	▽ 369.05
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										

ration of payrolls, the distribution of costs, and all record keeping in mine offices, is still being done by hand, in most cases.

The recent development of specially designed equipment for coal mines has eliminated the necessity of retaining the cumbersome hand system. As a result, during the last twelve months, several large mines and many small mines have installed mechanical equipment which enabled them to increase efficiency, reduce costs, and derive more information in considerably less time.

Management needed information to serve as a guide to production costs. Governmental regulations and requirements necessitated additional breakdowns of pay and deductions from pay. Union contracts required that the employee be shown hours worked, rate of pay, and total earnings for each rate. Mechanical bookkeeping had not been developed to the point where it could furnish this information, due to lack of accumulating registers. In 1948, The National Cash Register Co. introduced their twin tools of production which provided up to forty-two accumulators.

Payroll Accrual and Labor Distribution

The ideal system requires two distinctly different types of machines. One produces the daily time and accrual card in duplicate which provides the employee with the chronological history of all hours worked and money earned each day; and at each rate for the entire day period as required by union contracts. The other machine permits analysis or distribution of labor by occupation or account number, thus balancing payroll daily against cost of production.

Payroll Writing

The flexibility of the distribution machine is clearly shown in the payroll writing application. By merely unlocking one key, the machine is

PAY RECEIPT

I hereby certify that I have examined the statement below and approve the same as stated; and further, I do hereby approve and authorize all deductions made thereon as shown and the balance is accepted by me as full payment of all money due me from CORPORATION.

HOURS AND CODE	EARNINGS	DEDUCTIONS	NET PAY
* 88.00 B	196.55	MG 16.40	
* .00	196.55	F 1.97	
* .02		C 3.25	
		R 2.00	
		T 15.00	44.68
* .00		H 18.75	
* .00		J 92.50	
		L 2.00	

(Sign Here) .....

Witness .....

EXPLANATION OF CODE LETTERS

EARNINGS

B - Total Hrs. & Amt.

DEDUCTIONS

C.01 - Blue Cross Hosp.
C.02 - Doctor & Local Hosp.
D.03 - Miscellaneous Tax
D.04 - Special Collection
E.05 - Death Benefit
E.06 - Electric Power
E.07 - Miscellaneous
F - F. I. C.
G - W/H Tax
H - Bonds
J - P. M. Co.
L -
N - Cash Advance
P - Union Fees & Assessments
R - Union Dues
S - Home Purchase
T - House and/or Garage Rent
U - Coal Purchased

MAY 15 49

ready to produce in one operation, all of the following records:

1. Detailed pay statement.
2. Pay envelope or check.
3. Payroll Journal — Check Register:
   a. Gross Earnings to-Date.
   b. Withholding Tax To-Date.
   c. Current Bond Balance.
5. SS1b, State Unemployment Insurance report and W-2, prepared on the machine from the to-date information provided on the Employees Yearly Earnings Record.
6. Detailed report to union on Dues, Fees, and Assessments collected.

Up to seven copies of journal may be produced, if desired, providing listings to interested departments as a by-product of payroll writing.

All of these records, with totals for General Ledger, can be produced at the rate of 100 to 125 employees per hour, depending upon the number of deductions active the particular pay period. This means that in a mine employing 500 to 650 men, the *complete* payroll may be written and vouchered for General Ledger in an eight hour day by one person. When the last pay statement is written, the payroll is complete, and no further posting to any record except the purchases to the Bond Ledger is required. Accompanying the rapid rate of production are the advantages

150 XXVM 4-61

DAILY TIME AND EARNINGS RECORD

DATE	REGULAR EARNINGS				OVERTIME EARNINGS				PREMIUM AMOUNT		PICK-UP		TOTAL TO DATE	
	RATE	HOURS	AMOUNT	SHIFT DIFF	RATE	HOURS	AMOUNT	SHIFT DIFF	6TH DAY	7TH DAY	HOURS	AMOUNT	HOURS	AMOUNT
1 149	1756	800	14.05	.32									800	14.37 *
1 249	1756	750	13.17	.30	2634	10	.26				800	14.37	1560	28.10 *
1 249	1780	50	.89	.02							1560	28.10	1610	29.01 *
1 349	1756	800	14.05	.32	2634	200	5.27	.08			1610	29.01	2610	48.75 *
1 449	1756	800	14.05	.32	2634	10	.26				2610	48.73	3420	63.36 *
1 549	1756	800	14.05	.32					7.19		3420	63.36	4220	84.92 *
1 649	1756	800	14.05	.32	3512	200	7.03	.08		14.21	4220	84.92	5220	120.61 *
1 649								.09			5220	120.61	5220	120.70 *
1 749	1780	800	14.24		2670	150	4.01				5220	120.70	6170	138.95 *
1 849	1756	800	14.05		2634	10	.26				6170	138.95	6980	153.26 *
1 949	1756	800	14.05		2634	50	1.32				6980	153.26	7830	168.63 *
1 1049	1756	800	14.05								7830	168.63	8630	182.68 *
1 1149	1756	700	12.29								8630	182.68	9330	194.97 *
1 1149	1780	100	1.78		2670	50	1.34				9330	194.97	9480	198.09 *
1 1249	1756	800	14.05		2634	175	4.61		7.03		9480	198.09	10455	223.78 *
1 1349	1756	800	14.05							14.05	10455	123.78	11255	151.88 *
1 1449	1780	800	14.24								11255	251.88	12055	266.12 *
1 1549	1756	800	14.05		2634	50	1.32				12055	266.12	12905	281.49 *

STEEL CORPORATION
COAL DIVISION
PAYROLL JOURNAL

EMPLOYEE'S NAME	MINE NUMBER	GROSS PAY / NET PAY	TOTAL HOURS	B / C	GROSS EARNINGS / BLUE CROSS HOSP. DOCTOR & LOCAL HOSP.	D / E	R / P	S / T	F / J	L / M	M / G	U
		196.55 183.68	* 88.00 * .02	B C	196.55 3.25		R 2.00	T 15.00	F 1.97 J 9.250	2.00 18.75	12.60 16.10	172.50

inherent to mechanized bookkeeping, such as, machine printed figures, neater, complete, original records, automatic accumulation of proven general ledger payroll totals.

Inventory Records and Cost Distribution

Inventory records showing units and money, carrying balance on hand by item, by class, may be produced on the same machine that produced the daily time and accrual card. Distribution of costs may be made daily on either machine. Machine accumulated totals of cost distribution are balanced daily against value of items relieved from inventory.

Accounts Payable and Distribution

The complete voucher check and account distribution of payables is being produced on this equipment. Widespread acceptance of mechanical application of accounts payable by industry as a whole has proven the value of mechanizing this phase of accounting.

At one operation, the machine plan creates the remittance advice or voucher portion of the check, the invoice register, and distributes to the account to be charged. At a later operation, the check itself is written, and the check register created as a by-product. Under this plan, invoices are posted daily to the remittance advice and distributed daily to the proper account number thus proving the debits against the credits daily.

The normal hand system requires thirty-three separate steps while the average machine system requires only nine steps. It is apparent that by eliminating an average of twenty-four out of thirty-three steps, a large savings in time is gained.

Real Estate Accounting

A recent trend in coal mining is the sale of houses formerly owned by the company to the occupants. In a great many cases, the financing is being done by the company and payment is made through payroll deduction the same as rent.

This has necessitated furnishing the purchaser with a monthly statement showing the condition of his account.

Through the mechanical application, two steps are eliminated in the posting of these records as the principal payment does not have to be calculated. Under a hand system, four separate steps are required starting with gross amount paid. The interest must be figured and subtracted from gross amount paid and this amount must be subtracted from the outstanding balance.

Under the machine system starting with the gross pay, only the interest need be figured as the machine automatically figures the principal payment and automatically calculates the new balance.

Modern Accounting Machines will now do for the accounting departments of the Coal Industry what the mechanical miner is doing in the mine. The Old Fashioned pick and shovel, mule and wagon combination is in the process of being replaced by modern machine methods such as the "continuous miner." Today the costly, cumbersome, hand system in the office are being replaced by the twin tools of production.

Thus for a relatively small investment requiring only two basic style machines the coal mining industry can now completely mechanize all accounting requirements. These modern tools afford to the mining industry efficiency, accuracy, and speed resulting in a high rate of production with great reduction in cost.

Pusher loading one of the scrapers.

Carryall Scrapers Strip from 10 to 30 Feet of Overburden

At the Jefferson Coal & Coke Company Strip Mine

Near Burgettstown, in Washington County, Pennsylvania, the Jefferson Coal & Coke Company uses 3 Letourneau Model E-16 carryall scrapers to strip from 10 to 30 feet of the top overburden on the Pittsburgh seam of coal which averages 4½ feet in thickness. The overburden being moved by the scrapers consists of top soil, yellow shale and blue shale, and is hauled a distance of 700 to 1,000 feet to the spoil bank. These scrapers are assisted in loading with a D-7 Caterpillar tractor, have been used for about a year now and are doing a satisfactory job of moving the cover off the coal. Up to 65 feet of overburden is moved at this operation and that overburden which is not moved by the scrapers is taken with draglines. The Jefferson Coal & Coke Company is the second largest coal stripping operation in the Pennsylvania bituminous industry.

—— Please say you saw it in Coal Mining ——

—— Please say you saw it in Coal Mining ——

Loaded scraper on way to spoil bank.

Scraper dumping load on spoil bank.

Saint Francis College

Summer Session for Mining Men

The Saint Francis College Summer Session for Mining Men is part of a nation-wide movement to provide men "with a workable and salable skill which will enable them to enter and hold positions in occupational fields with capacity for improvement and promotion." With this in mind courses in mathematics, physics, mining, and the like have been introduced into this program. Large numbers of students have already earned their way through Saint Francis by working at off-hours in neighboring mines.

The program at Saint Francis is designed to cover a three-year period. A certificate is issued at the completion of this course which many of the local operators have agreed to honor as a recommendation for higher positions in mining work.

Time And Place

The session will open with registration on Monday, June 2. Classes will begin Tuesday, June 28. The session will close on Saturday, August 6. Class periods, fifty minutes in duration, will be held from Monday through Saturday inclusive. Students will attend approximately twenty-two lectures and two four-hour laboratories a week. Further information and admission blanks may be obtained by addressing: Rev. Francis P. Flanagan, T.O.R., Director of the Summer Session for Mining Men, Saint Francis College, Loretto, Pennsylvania.

Expenses

Tuition, athletic, and library fees are incorporated in the basic tuition fee.

The board and lodging fee includes the charge for occupancy of a share room and the fee for ordinary medical attention.

Although no change in rates is contemplated, the College reserves the right to change fees if it should at any time deem a financial adjustment necessary. The regular fees for one summer session are as follows:

Basic Tuition Fee	$72.00
Application Fee	1.00
Laboratory Fee	10.00
Board and Lodging (if desired)	94.00
Activity Fee	5.00
Health Fee	1.00
Library Fee	3.00
Athletic Fee	4.00

Books are purchased separately by each student, and should not run in excess of $15 a session.

Admission

Graduation from a recognized high school, together with two letters of character reference fulfill the entrance requirements. Special students may be admitted in unusual cases, without graduation from secondary school, if they can give evidence of their ability to carry the work.

CURRICULA

First Summer Session

Subject	Class Hours Weekly
Practical English I	3
Mining I	6
Labor Problems	6
Introductory Economics	3
Mathematics I	3
Physics I and two 4 hour Labs.	1
	22

Second Summer Session

Practical English II	3
Mathematics II	5
Scientific Integration	3
Modern Society	3
Mining II	5
Mining Economics	4
Physics II and two 3 hour Labs.	3
	26

Third Summer Session

Practical English II	3
Mathematics III	5
Applied Everyday Psychology	3
Mining III	6
Advanced Mining Economics	4
Physics III and two 4 hour Labs.	1
	22

COURSES OF INSTRUCTION

First Summer

Practical English I—3 hrs. a week. Fundamentals of grammar. Punctuation, capitalization, and paragraphing. Business letter writing. Mining terminology. Written reports designed to develop clarity and continuity of expression. Father Hines.

Mining I—6 hrs. a week. Lectures, moving pictures and lantern slides, illustrative of coal mining and the allied industries. The history of coal mining followed by a paroramic picture of the industry at the present time. Diverse uses of coal and the dependence of the industrial life of America upon coal. Coal mining as a career. The coal miners contributions to society. A course designed to stimulate interest in the mining industry. Several persons of outstanding reputation in the field have agreed to attend round table discus-

sions, as well as to give lectures in the course during the first summer.

Labor Problems—6 hrs. a week. The agricultural civilization of Medieval Europe. The rise of towns and the development of the guild system. The coming of cities and the industrial revolution. Free enterprise as a fundamental prerogative of democracy and the American system. Mr. Powers.

Introductory Economics—3 hrs. a week. Trade and barter. The development of the monetary systems. Usury, banking and investments. The development of trusts and corporations. Their relationship to government and social welfare. To be followed by the second summer of Mining Economics. Mr. Powers.

Mathematics I—3 hrs. a week. Simple arithmetic functions, taught in the method of the Army Specialized Training Programs. Addition, subtraction, multiplication, division, fractions and decimals, roots and powers. Problems involving the above processes, based on practical mining material. This course is intended to teach accuracy in arithmetical calculation, as well as to build a foundation for the fellowing courses in algebra and trigonometry. Mr. Dotsko.

Physics I—1 lecture and two 4-hr. labs. Introduction to electricity, conductors and non-conductors, static electricity, magnetism, electrical measurements, use of ammeter and voltmeter. Electrical transmissions, types of electrical circuits, electro-magnetism, and the simple motor. Father Ginnocchio.

Second Summer

Practical English II—3 hrs. a week. A continuation of Practical English I. A study of the fundamentals of English grammar with greater emphasis placed upon the acquirement of a working vocabulary.

Mathematics II—5 hrs. a week. Algebraic functions and equations, addition, subtraction, multiplication, division, binomials, roots and radicals, quadratics The practical application of algebra to mining work. Problems.

Scientific Integration — 3 hrs a week. An explanation of the material universe in the light of scientific knowledge. The structure of the atom, electrons and the primary physical laws of gravity, energy, and the like. The chemical composition of matter. The astronomical universe as an atomic pattern. The formation of the earth. Geology.

Modern Society — 3 hrs a week. An analysis of some of the more important contemporary social problems against the background of the mining world. The ethics of race problems, social groups, and the mechanics of group behavior.

Mining II—5 hrs. a week. A continuation of Mining I. The exact subject matter is as yet undetermined.

Mining Economics—4 hrs. a week. How and why coal is sold; the market into which Pennsylvania coal moves, and its competition with other coal. Its competition with water power, gas and oil. The effect of freight rates, cost of production and carriage of coal on the marketing of coal. The necessity of maintaining a free enterprise universally, in order to secure economic stability for the industry. Stability of the industry as a means of security for the supervisors as well as for the laborers. Why coals are screened; the importance of careful mining as a prerequisite for the most advantageous sale of coal.

Physics II—3 lecture hrs. and two 3-hr. labs. a week. Direct current motor, review of electro-motor and the simple motor. Types of direct current motors, the construction characteristics and uses of field coils, armatures, commutators, and brushes. Common maintenance problems.

Third Summer

Practical English III — 3 hrs. a week. A continuation of Practical English I and II with greater emphasis placed upon oral expression. A training which will enable the individual to express himself more clearly and intelligently.

Mathematics III—5 hrs. a week. A continuation of Mathematics II, with an introduction to geometric and trigonometric functions. Emphasis on the tangent. Correlation of Mathematics I, II, III, calibrated to student ability.

Applied Everyday Psychology—3 hrs. a week. An analysis of the problems of personal and social adjustment. Special attention will be given to the principles and methods of developing, maintaining and improving ones social effectiveness.

Mining III—6 hrs. a week. An appreciation course built on the principles and methods of Mining I and II. A series of lectures to stimulate interest in, and good feeling toward the mining industry. The exact subject is as yet undetermined.

Advanced Mining Economics—4 hrs. a week. How operating costs are determined; the effect of productivity on cost of production. The effect of the attitude of labor on productivity. The economy of decreasing running time compared to maintenance of running time, but producing smaller daily tonnages. Budget. Effect of mechanical failures on cost of production. The necessity of lowering of production costs to insure security, increased earnings, and social gains. Show that fixed charges, power and supplies are as important as labor, and the necessity for good planning. Why safety pays dividends.

Physics III — 1 lecture, two hrs. labs. a week. Applied electricity, controlers, control panels, circuit relations, diagrams or prints, power transmissions, power losses, bonding, fusing, and protective apparatus.

Mine Examination Questions & Answers

Q. 5. Fill in blank spaces in the accompanying gas chart. (Page 35.)

Q. 6. Make out a (sample) fire boss report according to the requirements of the law.

A. 6. The fire boss report shall contain the following:

(30 pts.)

(1) Date

(2) Nature and location of any danger found.

(3) Time taken in making the examination.

(4) State location, or portion of mine examined and its condition.

(5) Signed: the entire report to be made in ink.

Q. 7. (a) What is air?

(b) What is commonly called "fire damp"?

(c) What is "after damp"?

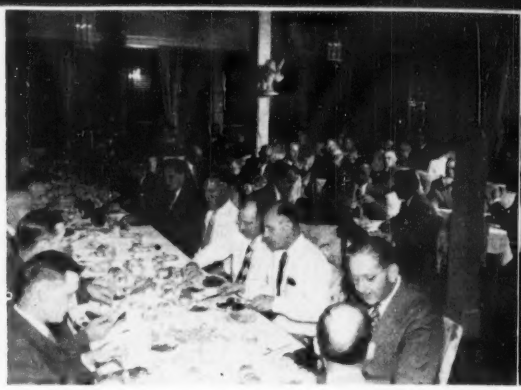
(d) What is "black damp"?

(e) What is "white damp"?

(f) What is "stink damp"?

A. 7. (10 pts.) (a) Air is the fluid which we breathe, and which surrounds the earth: the atmosphere, it is invisible, odorless, insipid, transparent, compressible, elastic, and ponderable. Air is not an element, but is composed of Oxygen, Nitrogen, a small amount of Carbon Di-

(*Continued on Page* 35)

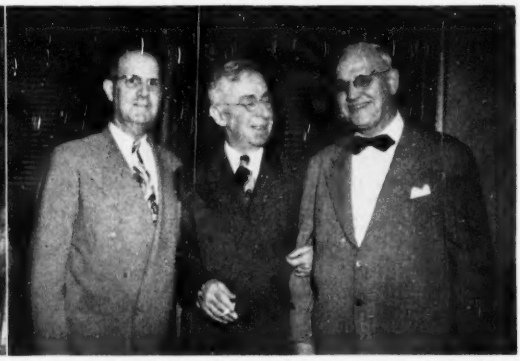


Two views of the guests at dinner.

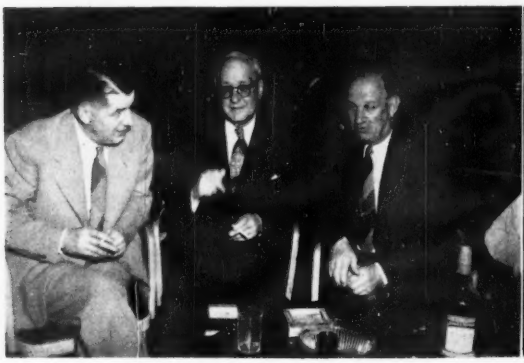
Western Pennsylvania Bituminous Coal Operators Golf Association Opens 1949 Season at the Nemacolin Country Club.

Opening of the Western Pennsylvania Bituminous Coal Operator Golf Association took place at the Nemacolin Country Club near Brownsville, Pennsylvania, on Thursday, May 9. Weather conditions were ideal for the opening day and the turnout of golfers was good for an opening day. Attendance at the dinner was better than average over the season. Before and after the dinner the gathering was unusually well behaved. Top honors at golf were won by Edwin Lee, Sales Manager for the Lee-Morse Company of Charleroi, Pennsylvania, with a score of 72, or par for the course. Mr. Stewart Johnson of the R. G. Johnson Company of Washington, Pennsylvania, won a set of golf irons in a general raffle. Mr. T. E. Johnson, Executive Secretary of the West Virginia Coal Operators Association was the guest speaker of the evening.

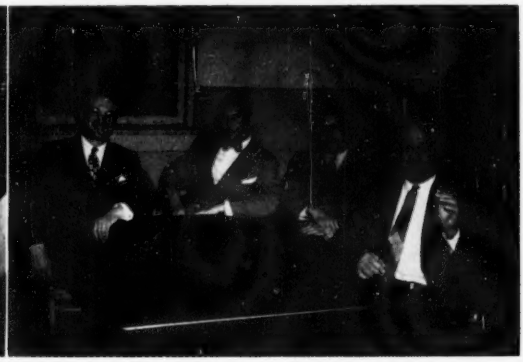
T. E. Johnson making the principal speech of the evening.



T. F. Stiffler, Pres. Stiffler Industrial Lubricant Co.; Ed. Siemon, Div. Mgr., Hillman Coal & Coke Co., J. H. Phillips.



J. T. Core, Chief Engineer, Buckeye Coal Co., Nemacolin, Pa., T. E. Johnson, Executive Secretary, West Virginia Coal Operators Association, and Alex. Grant, General Manager Buckeye Coal Co., Nemacolin, Pa.



Homer Goddard, Gulf Oil Corp., Bruce Madera, Carpentertown Coal & Coke Co., Dorsey Straitiff, Gulf Oil Corp., and Fred O. Fowler, of Thomas Brown, Inc.

George Sells, Supt. Blast furnaces, Leo Kraemer, Supt. Coke plant, Jas. Callahan, Purchasing Agent, and J. H. Phillips, Gen. Purchasing Agent. All of the Pittsburgh Steel Co.

Stewart Johnson, President R. G. Johnson Co., receiving the set of golf irons.

oxide, and some water vapor. The volumes of these gases are as follows:

Oxygen	20.96%
Nitrogen	79.00%
Carbon Dioxide	00.04%

(b) (10 pts.) Fire damp is referred to as inflammable or explosive mixture of methane and air.

(c) (10 pts.) After damp is referred to as the products resulting from an explosion or fire, consisting chiefly of Carbon Monoxide, Carbon Dioxide, Nitrogen, Hydrogen, Water Vapor, and some unburned Methane.

(d) (10 pts.) Black damp is a mixture of incombustible gases consisting chiefly of Carbon Dioxide and Nitrogen.

(e) (10 pts.) White damp is generally understood as referring to Carbon Monoxide gas.

(f) (10 pts.) Stink damp is used in reference to Hydrogen Sulphide.

FIRE BOSS EXAMINATION
BITUMINOUS DIVISION
Section 2 June 4, 1948

Q. 8. If you were examining a mine as a fire boss, what would you do under the following conditions: (pre-shift examinations)

(a) If you found a trap door left open thus short-circuiting the air current?

(b) If the fan stopped while making your examination?

(c) If you found a large accumulation of explosive gas in the active workings?

A. 8. (a) (30 pts.) I would cut

GAS CHART

Answer 5. Section 1 FIRE BOSS EXAMINATION June 4, 1948 Identification No. _____

GASES MET WITH IN THE BITUMINOUS COAL MINES OF PENNSYLVANIA

NAMES	METHANE	CARBON MONOXIDE	HYDROGEN SULPHIDE	CARBON DIOXIDE	NITROGEN	5 pts.
Chemical Symbol	CH_4	CO	H_2S	CO_2	N_2	5 pts.
Specific Gravity	.555	.967	1.19	1.53	.967	5 pts.
Is it combustible?	Yes	Yes	Yes	No	No	3 pts.
Does it support combustion?	No	No	No	No	No	2 pts.
Is it poisonous?	No	Yes	Yes	No	No	3 pts.
How is it detected?	Flame safety lamps; chemical analysis; special detecting apparatus.	Canary birds; Japanese waltzing mice; chemical analysis; special apparatus.	Odor; chemical analysis; and special detectors.	Chemical analysis lime water test; action on flame of safety lamp.	Chemical analysis; and dimming action on flame of safety lamp.	10 pts.
Explosive range percentage in the air.	5 to 15	12.5 to 74	4.3 to 46	———	———	5 pts.
Ignition temperature Fahrenheit	1100 to 1380 degrees	1100 to 1300 degrees	700 degrees	———	———	2 pts.
Origin	Occluded in pores of coal, clay veins, etc. as result of decomposition of vegetable matter in presence of water and absence of air.	Result of incomplete combustion, mine fires, explosions and blasting.	Decomposition of sulphur compounds. Found in old pipe lines and in stagnant water.	Product of complete combustion of fuels; rotting of timber; breathing of men and animals.	Found naturally in the atmosphere.	10 pts.
What is its effect on life?	Causes death if breathed in high concentrations. Otherwise no ill effect.	.1% in atmosphere causes collapse in one hour.	.07% will cause death in one hour.	Increases lung ventilation. Will suffocate if breathed in high concentrations when oxygen content is low.	Will suffocate if breathed in high concentrations when oxygen content is low.	10 pts.

off all electric power from the affected area and fence off all entrances to this area, and place an approved danger signal on said fencing. I would then proceed with my examination and if no accumulation of explosive, noxious, or other dangerous gases were found I would then close the door, and make a re-examination of the affected portion of the mine. However, if falls or other places that were inaccessible were on this split and affected by the door being open, I would leave the door open and report verbally to the mine foreman of this condition and make a written report in the fire boss record book of same.

(b) (30 pts.) I would wait a few minutes to see if the fan would start again and if it did not I would telephone the person in charge on the surface to de-energize the power circuits of the mine. If the fan was not started immediately I would return to the surface or to the fire boss station and wait until the fan was put in operation, and then re-examine the mine.

(c) (30 pts.) I would cut off all electric power from the affected erea and place danger signals on all electric switches. Fence off the entire mine or portion of mine in which the accummulation of gas is found and place approved danger signals on said fencing. I would not permit any person to enter this portion of the mine. I would immediately report this condition to the mine foreman and make a record of the occurrence in the fire boss record book.

Q. 9. As a fire boss what would you do to prevent accidents resulting from transportation?

A. 9. (50 pts.) I would see that the mining laws were observed and enforced, especially as they relate to transportation requirements. Observe the condition of the tracks and equipment and report to the mine foreman any defects found.

Observe how the haulage men are performing their duties and call their attention to any unsafe acts committed and also report same to the mine foreman.

Observe how the miners handle their cars, instructing them how to handle them safely, and calling their attention to any unsafe acts of violations of mining laws, safety rules, and report same to the mine foreman.

Q. 10. As a fire boss, what would you do to prevent accidents resulting from falls of roof and coal?

A. 10. (50 pts.) I would instruct all workmen to timber their place systematically. If a timbering plan was adopted I would see that such plan is posted where the miners could observe same, and see that such plan was strictly complied with, additional timbers to be used where necessary. Instruct all workmen to carefully examine their working place and make it safe before doing any other work.

Properly instruct the workmen how to test roof and sides using the visual, sound and vibration method of testing. Caution workmen to carefully examine their place after each shot and frequently during working hours and to stop frequently and listen for roof movements.

I would observe and see that each working place had the proper supplies required. See that all workmen are provided with the proper tools

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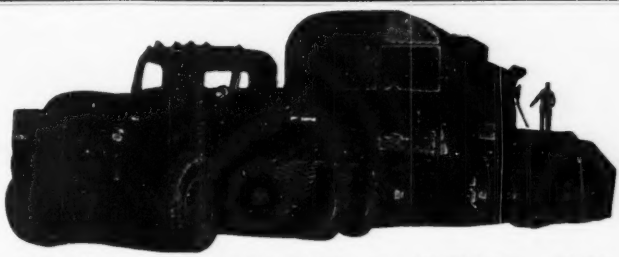

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and kept in good condition so as to be able to perform their work properly. I would also carefully examine each place for loose roof and sides and have the workmen promptly take down all loose or doubtful roof and sides or properly secure same with adequate timbering. See that the coal is properly spragged.

Q. 11 (a) What instruments would you use to measure the air current?

(b) If the anemometer reading shows 300 lineal feet per minute, and the entry is 10 feet wide at the top, 12 feet wide on the bottom and 6 feet high, what is the quantity of air passing per minute?

A. 11 (a) (20 pts.) 1. Anemom-

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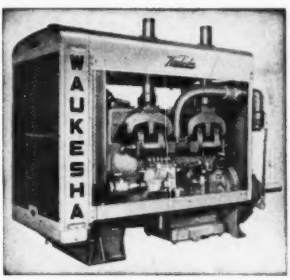

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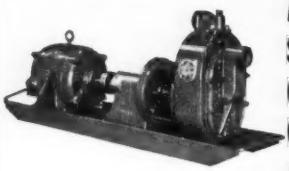

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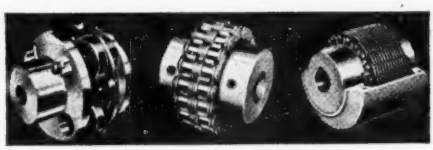

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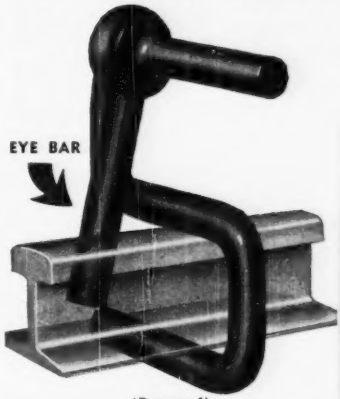

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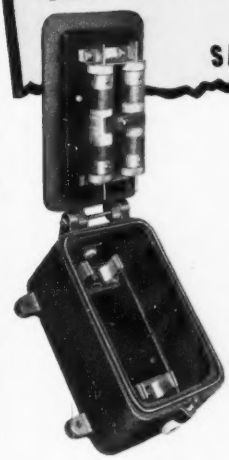

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The fuses are the switch blades and are the only parts that should need replacing. Other features include; Spring brass fuse support that gives a snap-type break when opened. Copper supports hold blades in perfect alignment...Reinforced clips held permanently in line by grooved supports...Clamp type terminal in the center. One or two fuses may be used, capacities: 70-200 amps.

Also used as protective disconnecting switch for any motor in its range, or for feeder protection at night when trolley line switch is open.

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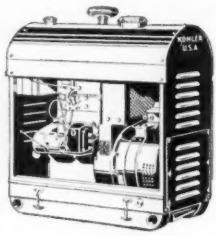

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IMMEDIATE DEVELOPMENT OF SYNTHETIC FUEL PLANTS

(*Continued from Page* 10)

Prototypes Should Be Built Now

He stated that sufficient data already are available to permit an immediate start on design work for the initial commercial plants, and he recommended that three or more commercial-size plants should be built as prototypes now, using both coal and oil shale as the raw materials. These model plants should be built and operated by private industry with financial assistance, if necessary, provided by the Reconstruction Finance Corporation.

"With few exceptions," he said, "oil company executives agree that coal, oil shale and natural gas are destined to become a major source of oil supply. The major issue is 'when.'"

Legislation to accomplish this purpose was introduced during the last regular session of Congress, Mr. Schroeder said. Hearings on the House bill, introduced by Representative Charles A. Wolverton of New Jersey, were completed, and it was reported favorably by the House Interstate and Foreign Commerce Committee. It is anticipated that the measure will come up at the next session.

Mr. Schroeder emphasized that though synthetics are not "here today" and are not the answer to the current liquid fuel problems, it is "equally true that synthetics still will not be available 5 to 10 years hence if the development work is permitted to lag today."

Self Sufficiency in Oil

"Several operating synthetic fuels plants, as envisaged by the Wolverton bill, would take us a long step forward toward our objective—self sufficiency in oil for whatever the future holds. They would provide the essential link between pilot plant research and commercial production, and a basis from which a large industry could grow very rapidly if necessary.

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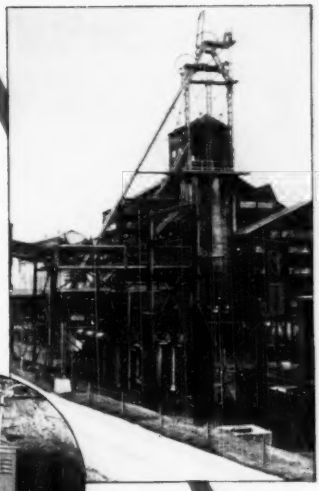
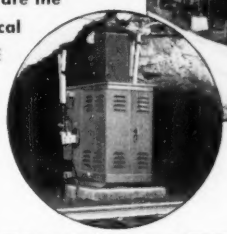
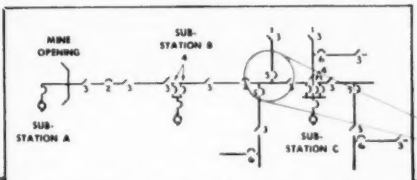
Typical example of how NEMACOLIN MINE boosts production levels *through proper sectionalization*

Electrical distribution at Buckeye's Nemacolin Mine was recently modified to conform to the Recommended Sectionalizing Practices of the Bureau of Mines. This modification was effected through the use of I-T-E Sectionalizing Switchgear — particularly, I-T-E Type KSC Automatic Reclosing Circuit Breakers. Here are the detailed Sectionalizing Recommendations, and a typical example of how Nemacolin adapted them with I-T-E equipment:







THE RECOMMENDED D-C SECTIONALIZING PRACTICES:

Key

1 In each of the following cases, sufficient feeder and return circuit capacity should be provided so that the overcurrent protective device will be opened by a dead short-circuit at the most remote point of the circuit.

2 An overcurrent protective device should be installed between each two substations at such a point in the circuit that the resistance between each station and the device is approximately the same.

3 A disconnect switch or protective device should be placed at not more than 1,500 ft. intervals in every power line.

4 An overcurrent protective device should be used in each circuit leaving a substation. If automatic reclosing circuit breakers are employed for this, trip-free operating mechanism should be used.

5 An overcurrent protective device should be placed at each main-branch circuit.

6 Each mining setup should be protected by an overcurrent protective device. In some cases, it may be necessary to protect two setups by one device.

● Placing an I-T-E Type KSC Automatic Reclosing Circuit Breaker on each main-branch circuit effectively and dependably prevents trouble on one branch from spreading to others.

In event of overload, short circuit, or excessively low voltage, the KSC opens instantly, remains open a definite, predetermined time (1 — 45 secs.), and recloses automatically upon a return to normal line conditions. Faults are confined to the branch on which they occur, production in other sections goes on with complete safety! For further information on the I-T-E Type KSC — the only circuit breaker developed specifically for the mining industry — write for Bulletin 4611.

To find out how your mine can benefit from proper applications of I-T-E Sectionalizing Switchgear, consult the I-T-E Mining Specialist in your locality. He is thoroughly familiar with the Bureau of Mines' new recommended Standard Safety Rules for installing and using electrical equipment in coal mines, and he is fully qualified to advise and assist you in sectionalizing your electrical distribution system. Use his services without obligation.

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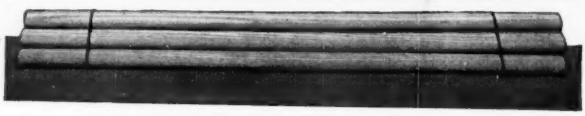

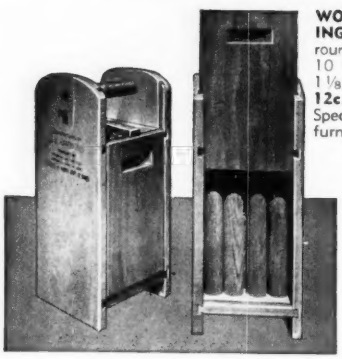

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No. 12 Powder Box	$ 2.40	"	No. 72 Powder Box	$ 7.50	"
No. 16 Powder Box	$ 2.85	"	No. 90 Powder Box	$ 8.40	"
No. 20 Powder Box	$ 3.10	"	No. 6 Cap Box (Sizes 2½" x 3" x 6" Inside)	$ 1.70	"
No. 25 Powder Box	$ 4.20	"	No. 8 Cap Box (Sizes 2" x 2¾" x 8" Inside)	$ 1.70	"
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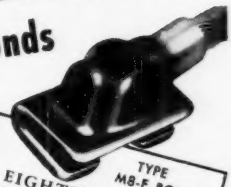

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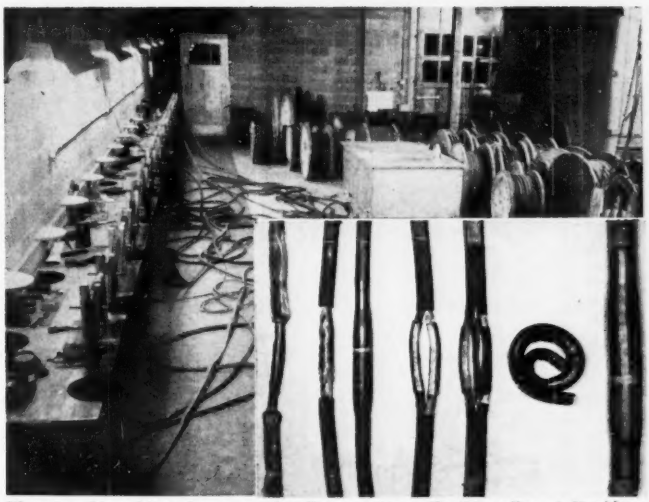

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1	35 BC Jeffrey Cutting Machine
4	35 A Jeffrey Cutting Machines
8	61 AM Jeffrey Conveyors (Head & Tail with 10 HP-DC Motors & Controls)
276	61 AM Jeffrey Conveyor Pans 5"-12" wide and 6' long.
3	61 AM Jeffrey Conveyor Pans ½ length
270	61 AM Jeffrey Conveyor Chains 12' long
4	61 HG Face Conveyors (Head & Tail with 5 HP-DC Motor & Controls)
21	61 HG Face Conveyor Pans 5' long & 15" wide
21	61 HG Face Conveyor Chains 10' long
2	61 EW Jeffrey Elevators (5 HP-DC Motors)
1	Brown-Fayro Car Spotting Hoist—5 HP
2	Acme Air Compressors—low type, 25 HP Motors
1	6 Ton Jeffrey MH-88 Locomotive
1	McGowan 3" Piston Pump, 5 HP Motor
1	Set MH-88 Jeffrey Locomotive Trucks, 6 Ton
1	Set Motor Trucks for 6 Ton G.E.

(Equipment is 250 V., D.C. 48" Guage Track)

Crystal Block Coal & Coke Co.

RELAYING RAIL

Immediate Shipment
500 Tons 25 lb. ASCE
300 Tons 30 lb. ASCE
500 Tons 40 lb. ASCE
Standard Drillings and Lengths
Can be saw cut to special lengths if desired.

MIDWEST STEEL CORPORATION
Charleston, W. Va.
Knoxville, Tenn. Portsmouth, Va.

FOR SALE

P. & H. 1055 L. C. Stripper

New Osgood 1006 Stripper

Northwest 80-D Combination, new.

Can be bought on Rental Purchase

* * *

Collins & Crabtree
2403 Wenzell Pl.
Pittsburgh 16, Pa.
Fieldbrook 1062

FOR IMMEDIATE SALE

2 McCarthy Vertical Drills, Model 106
1 Cleveland Pneumatic Wagon Drill, Model DR30
1 Loomis Clipper Drill
1 NW-80D Set of Sticks 22' 10" long with 2½ yd. Amsco dipper
1 Hi Lift, ½ yd. mounted on McCormick-Deering Tractor Model W9
1 2-yd. Page Dragline Bucket
1 2-yd. Hendrix Dragline Bucket
1 125KW Generator, 440-V 720 RPM, Electric Mfg. Co.
1 160KW Generator 220-V 1800RPM, General Electric

Sunnyhill Mining Company
Pittsburgh 16, Pa.

Strippers!

SEE 'CONTE' FOR:

Scrapers
Rippers
Power Control Units
Water Pumps
Wire Rope
Chain Saws
Conveyors
Compressors
Air & Electric Tools

SALES SERVICE RENTALS

Conte Equipment Corp.

Brushton Ave. at Thomas Blvd.
Pittsburgh 21, Pa. **PE. 6400**

RELAYING RAILS

2,000 tons of 60 lb. first class Relaying Rails at greatly reduced prices delivered your destination

M. K. FRANK
Park Building Pittsburgh, Pa.
New York Office, 430 Lexington Ave.
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REBUILT EQUIPMENT - - - - READY TO SHIP

SPECIAL BARGAIN

3—Type A3G Goodman Duck bills.

COAL DRILLS

2—Jeffrey—250 v. DC.

COMPRESSORS—SPECIAL BARGAIN

7—240 cfm Westinghouse 8 cyl. vert. 150 lb. pres. dir. con to 50 HP AC Slip ring or DC Motors.

MOTOR GENERATOR SETS—250 V. D.C. Motors 220/440 v. or 2200 v.—3 ph., 60 cy.

No.	KW	Make	RPM
3	250	Westinghouse	1200
1	200	Westinghouse	720
2	200	Westinghouse	1200
1	100	Westinghouse	700
1	100	General Electric	900
1	100	Westinghouse	600
1	100	General Electric	1800
1	100	Reliance	580
1	100	Delco	1200
2	90	Westinghouse	680
4	75	Westinghouse	720
1	75	Westinghouse	1200
1	60	Westinghouse	1200
1 NEW	50	General Electric	1800
3	40	Westinghouse	900
2	30	Westinghouse	720

125 V. DC M.G. Sets

1—100 kw. G.E. 125 v. 900 rpm. 220/440 v. 3 ph. 60 cy. AC Syn.
1—125 kw. G.E. 125 v. 1200 rpm. 220/440 v. 3 ph. 60 cy. AC.
1—75 kw. West. 125 v. 1200 rpm. 220/440 v. 3 ph. 60 cy.

D.C. Generators—250 v. D.C.

No.	KW.	Make	Speed
1	250	West.	1200
1	175	G. E.	700
3 New	135	G. E.	1150
1	125	West.	560
1	125	Allis-Chal.	1150
1	110	West.	700
1	100	Allis-Chal.	1150
1	75	West.	750
1	40	G.E.	720

A.C. Generators—220/4000/440/220 v.

No.	KW.	Make	Speed
1	125	West.	257
1	450	Elec. Machy.	120

Pumps With A.C. or D.C. Motors

Qua.	Gpm.	Head	Kind	Make
3	1200	300	Cent.	Worthington
3	1100	323	Cent.	Worthington
3	1000	336	Cent.	Worthington

D.C. Motors—230 volts

No.	H.P.	Make	RPM	Type
1	175	G. E.	550	MD

SAVE OVER 50% ON NEW BLOWERS AND VENTILATING FANS

AXIAL FLOW VENT. FANS

1—4000 cfm 6x3" stat. pres. Sturtevant with 4/1.2 hp., 1750/1150 rpm., 220/3/60 motor.
2—4000 cmf 3" stat. pres. Sturtevant 2 speed AC Motors.
2—5000 cfm 1.8 stat. pres. Sturtevant 220/440 v. AC Motors.
31—6000 cfm Sturtevant Bul. No. 512389, 3" stat. pres., 7 blade dir. con. 5/1.5 hp. 1765/1175 rpm., 220/440 v. AC West. TEFC Motors.
2—6000 cfm Sturtevant 1.65" stat. pres. 220/440 v. AC Motors.
1—7500 cfm Clarage 7½ hp., 220/440 v. 2 speed motor.
2—12000 cfm 3" stat. pres. Sturtevant with dir. con. 10/3 HP. 1775/1180 rpm., 220/440 v. TEFC Motors.

HOISTS OR WINCHES

200—1½ ton Hand Cranked ratio 27:1 thru an enclosed double reduction gear unit with 4 planetary gears mounted on steel plate complete with 48' of ⅛" cable, ratchet type brake, push button release.

CAR PULLERS

100—Brand New with ¼" cable, 1½ and 2 ton A.C. or D.C. Motors.

COMPRESSORS

1—315 CFM Ingersoll Rand Portable, 100 lbs. pres. driven by 105 HP Waukesha Oil Engines, 860 rpm.

BARGAIN — FOR SALE

100 KW. Diesel Engine Generator Sets

11—100 KW., 250/275 v. D.C. Delco Generators dir. con. to 150 H.P., Model GBD-8, 5½ x 7, 8 cyl. Superior Diesel Engines, electric starting with muffler, power panel and accessories.

Practically as good as new—
Only Used for spares.

DUQUESNE ELECTRIC & MANUFACTURING CO. - PHONE MONTROSE 5800 - PITTSBURGH, PA.

NEW AND REBUILT
STORAGE BATTERY LOCOMOTIVES
Any Size Any Track Gauge
Greensburg Machine Co.
Greensburg Pennsylvania

ADVERTISE YOUR USED OR SURPLUS EQUIPMENT IN THIS SECTION OF COAL MINING FOR QUICK SALE

FOR SALE

(4) DW-10 Caterpillars with Scrapers. Marion Model 362 Shovel Front. Buckeye Model 70, ¾ yd. Shovel Front.

A. C. R. COMPANY
19615 Nottingham Rd., Cleveland, Obio
Kenmore 8000

CALL MOORHEAD
FOR REBUILT ELECTRICAL EQUIPMENT

LOCOMOTIVES

Haulage and Gathering Locomotives

20 Ton Jeff. and G.E. 500 v. 42" Ga. (Can be rewound 250 v.)
12 Ton West. 250 v. 36 or 44" Ga.
8 Ton Goodman 500 v. 42/44" Ga. (Can be rewound 250 v.)
6 Ton West. 250 v. 904 Motors 36" Ga.
2-4 Ton Goodman 42" Ga. 250 v. with reel.

SLOPE AND SHAFT HOISTS

50 HP Heyl Patterson sgl. fixed drum.
75 HP Meade Morrison sgl. fric. drum.
75 HP Diamond sgl. fric. drum.
200 HP Vulcan dbl. drum shaft.
300 HP Lidgerwood sgl. fixed drum.

STORAGE BATTERY LOCOMOTIVES

6 Ton G.E. perm. 36/44" Ga. HM 825 BB.
5½ Ton Ironton Type A 36/42" Ga.

MINING MACHINES

112 EJ Goodman 230 v. DC 7½' bar.
35 B Jeffrey Perm. 230 v. 7½' bar.

M-G SETS—ROTARIES (3 ph 60 cy.)

450 KW G.E. 250 v.—710 HP. G.E. Syn. 2300 v.
300 KW West. 250 v.—435 HP Syn. 2300 v. 1200 RPM.
300 KW G.E. Rotary 250 v with 3-110 KVA 2200/4000 v. Transformers.
300 KW 250/125 v. con. 2-150 KW West. SK 125 v. Gen. dir. con. 450 HP Motor.
250 KW West. SK 250 v.—350 HP ATI Syn. 2300 v. 1200 RPM.
100 KW West 125-150 HP West. Ind.
75 KW 75 v. West.—100 HP West. Ind.
50 KW 125 v. G.E.—75 HP G.E. 2200 v.
35 KW G.E. 125 v.—50 HP 220/440 v. Ind.
10 KW Bardco 125 v.—15 HP 220/440 v.

COAL CRUSHERS

18x24 and 18x30 New Scottdale dbl. roll.

AIR COMPRESSORS

750 cu. ft. 100 lb. pres. Chic. Pneu. 2 stage Type OCB 17 and 10x12".
356 cu. ft. 100 lb. pres. Chic. Pneu. 12x10.
245 cu. ft. 100 lb. pres. Ing. Rd. ER1, 10x10.
164 cu. ft. Chic. Pneu. Steam Type.

DC MOTORS

HP	Make	Voltage	Wdg.	Speed
7½	West. SK 43	230	cp.	1150
7½	G.E.	230	sh.	1750
7½	West.	230	cp.	1050
10	West. SK	230	cp.	1150
10	G.E. CD	230	cp.	1750
13	West. SK	230	sh.	875
15	West. SK 93	230	cp.	850
15	Cr. Wh.	230	sh.	1750
15	West. SK 110	230	cp.	750
20	West. S 6	230	cp.	975
20	Al. Ch. BBDP	230	sh.	1150
20	Cr. Wh. BB	230	sh.	1150
30	West. S 7	230	sh.	1025
30	West. SK 93	230	cp.	1750
40	G.E. RC	230	sh.	1150
40	G.E. RC	230	sh.	750
50	West. SK	230	sh.	1750
75	Rel.	230	sh.	850
75	West. SK 153	230	sh.	1150
125	West. SK 193	230	sh.	450/1000
200	G.E. RC	550	cp.	875
200	West. SK 201	230	sh.	400/800
375	West.	230	cp.	430/860

AC MOTORS (3 ph. 60 cy.)

HP	Make	Wdg.	Spd.	Type
300	West.	S.R.	600	CW
300	West.	S.R.	450	IM
250	Al. Ch.	S.R.	435	——
160	G.E.	S.C.		IK
150	G.E.	S.C.	695	KT
150	G.E.	Syn.	600	ATI
125	West.	Syn.	277	——
100	G.E.	S.R.	450	IM
100	Al. Ch.	S.R.	600	
75	West.	S.C.	860	MS
60	West.	S.C.	1200	CS505
75	G.E.	S.R.	575	ITC
50	Al. Ch.	S.C.	1750	——
40	G.E.	S.C.	860	KT
35	G.E.	S.C.	1200	IK
30	G.E.	S.C.	1200	KG405
25	Cr. Wh.	S.C.	600	——
25	Cr. Wh.	S.C.	860	——
25	Cr. Wh.	S.R.	600	——
20	Cr. Wh.	S.C.	900	——
15	L. A.	S.C.	3600	——
15	West.	S.C.	1750	W326
10	West.	S.C.	860	CS
10	West.	S.C.	1160	CS
10	West	S.C.	570	CS566C
7½	Comm.	S.C.	865	P326
5	West.	S.C.	565	CS546
5	West.	S.C.	1150	CS
3	Cent.	S.C.	1750	——

REDUCTION UNITS

500/700 HP Morse Chain Drive. 4.28 to 1.
300 HP V Belt dr. pulleys 30" and 48" supported by 2 roller brgs. with pedestals.
150 HP Nuttall 1.6 to 1.

MOORHEAD ELECTRICAL MACHINERY CO. MAyflower 7900 Pittsburgh 19, Penna.

A-6 100 hp

HR-4 110 hp

H-6 150 hp

HR-6 165 hp

HS-6 200 hp

NH-6 200 hp

HRS-6 225 hp

L-6 250 hp

NHS-6 275 hp

NHRS-6 300 hp

NVH-12 400 hp

NVHS-12 550 hp

5 New CUMMINS DIESELS

1. **HR-400**—110 hp (max.), at 1800 rpm. 5⅛" bore, 6" stroke.
2. **HRS-600**—225 hp (max.), at 1800 rpm. 5⅛" bore, 6" stroke. Supercharged.
3. **NHRS-600**—300 hp (max.), at 2100 rpm. 5⅛" bore, 6" stroke. Supercharged.
4. **NVH-12**—400 hp (max.), at 2100 rpm. 5⅛" bore, 6" stroke.
5. **NVHS-12**—550 hp (max.), at 2100 rpm. 5⅛" bore, 6" stroke. Supercharged.

With the addition of 5 new engines, there's now a Cummins Diesel for any power job in the 50 (minimum) to 550 (maximum) hp range. Sixty-six individual models are available . . . with optional equipment to fit your specific operating requirements. Compounded units increase the Cummins range to 1440 hp.

The all-around economy of Cummins Diesels increases your profits on any automotive, marine or industrial job. Standardizing on Cummins Power gives you these additional advantages: engines, units and assemblies are interchangeable . . . service problems are simplified . . . replacement parts inventories are reduced . . . down-time is held to a minimum.

Cummins Engine Company, Inc., Columbus, Indiana

SEE YOUR CUMMINS DEALER

CUMMINS DIESEL ENGINES, INC.

209-13 N. 22nd St., Philadelphia 3, Pa., Tel. RI. 6-4460

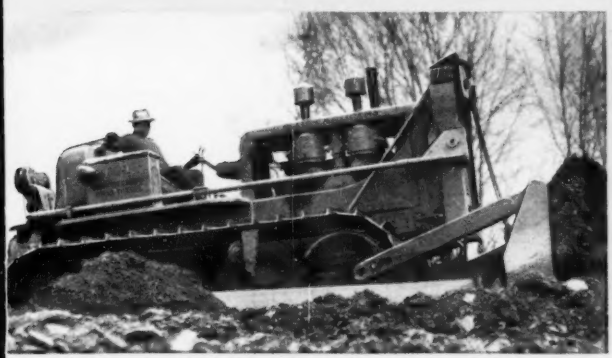
Branch: 2nd and Orange Sts., Mount Carmel, Pa., Tel. 1261

Branch: 6501 Hamilton Ave., Pittsburgh 6, Pa., Tel. Montrose 9784

Branch: Light and York Sts., Baltimore, Maryland, Tel. South 1281

HD-19's step up stripping speed

Gilleland Coal Co., Uniontown. 2 HD-19's (#1 with Baker Hydraulic Dozer; #2 with Carco Cable Dozer) strip overburden, clean coal seam, build roads, push scrapers on a round-the-clock schedule.



Boswell Fuel Co., near Windber. HD-19 works as bulldozer . . . shortening time on every cut. Perfectly-matched Gar Wood cable dozer takes deeper cuts . . . rolls bigger loads faster . . . gets back quicker for the next pass.

THE BIG ALLIS-CHALMERS HD-19 "out-pushes" and "out-'dozes" on every stripping job . . . any time of the year . . . under any conditions.

Because it's on tracks, it can be used everywhere on the job—on wet, slippery clay . . . on sandy or rocky going. No job's too tough to handle!

Let your Highway representative tell you today about HD-19 advantages. He's as close as your phone and will consider it a privilege to serve you promptly.

Allis-Chalmers Torque Converter Tractor . . . HD-19

IT'S RUGGED AND TOUGH . . . BUILT TO OUTPRODUCE & OUTLAST!

Weight: 40,000 pounds.

Power: 2 cycle General Motors Diesel—163 hp. at flywheel.

Speeds: 0 to 3 in low gear and 0 to 7 in high; reverse 0 to 5.5.

Torque converter: automatically balances load and speed without gear shifting.

Highway EQUIPMENT COMPANY

6465 Hamilton Ave. Pittsburgh, Pa.

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Allis-Chalmers • Jaeger • Baker • Gar Wood • Hough • Master • Thor • Wayne Crane • General Motors Diesel Engines • Lima Shovels, Cranes, Draglines

For Faster - - Safer - Easier timbering at the face use

STAR

Aluminum Alloy Mine Roof Jacks

★ 35% to 50% lighter weight
★ Rustproof

3 types of heads
3 types of bases
Various heights

Star Jack Co.
ELMWOOD PARK
CHICAGO 35, ILL.

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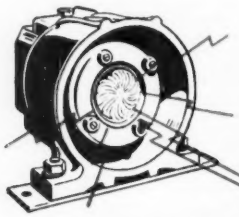
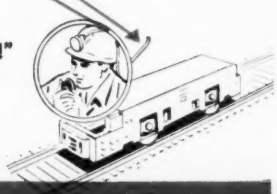


It Speaks For Itself!

That's right! The last two world's records for efficient production were made in Trolleyphone-equipped mines. Femco's push-button supervision helped modernize these mines. Coal out-put goes up, costs go down with this clear two-way, instant contact between mine-mouth and face, dispatchers and moving motors anywhere.

"For better Coal Control—Trolleyphone!"

- **Booms coal out-put**
- **Boosts costs**
- **Boosts Safety records**
- **Result: Product Profits**



FARMERS ENGINEERING AND MANUFACTURING COMPANY
549 BROADTOP AVE. - PITTSBURGH 11, PA.
Specialists in Electronic Communication Underground

Femco
TROLLEYPHONE
"It Speaks For Itself"

Does ADVERTISING Pay

We believe, you will agree, it does, to tell you about the

PERFORMANCE of ABC DRAGLINE BUCKETS

LOOK at the article in April issue of Coal Mining on Stripping Coal in Virginia, East Kentucky and Southern West Virginia. — Pages 23 to 34.

Why does this Stripping Contractor buy ABC Buckets?

Because they have

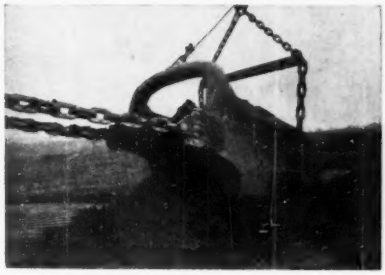
The most RUGGED Construction
Their low MAINTENANCE cost
Their DIGGING and LOADING ability
Their BALANCE permits carrying a full load
No dropping away sharply from the lip

PERFORMANCE

You can use ABC Buckets as others do and pay for them from savings over others.
DRAG CHAINS - SOCKETS - DUMP BLOCKS - LIPS, ETC. IN STOCK. CONTACT US.

Anthracite Bucket Corp. - - Frackville, Pa.

ESCO DRAGLINE BUCKETS



COAL STRIPPERS KNOW

→ that ESCO Buckets last longer than other makes and operate at less maintenance cost.

→ that production records, PROVE that stripping goes faster when ESCO Dragline Buckets are on the job!

→ that the clean cutting lip on ESCO Dragline Buckets contains integrally cast streamlined tooth horns. LONG, SHARP, TEETH are placed for maximum efficiency—outside teeth near corners—a WIDER BITE and easier digging.

→ that they can often use larger size ESCO buckets than possible with other makes because of maximum strength without excessive weight.

Just A Few Of The Reasons Why You Should Insist On ESCO On ANY Job!

ESCO buckets are made in four types: Medium, Stripping, Standard and Heavy Duty in sizes from 3/8 to 18 yards.

Made by: ELECTRIC STEEL FOUNDRY CO. . . . . Portland 10, Oregon and 728 Porter St., Danville, Ill.

Sold by:

KANAWHA STEEL & EQUIPMENT COMPANY

CHARLESTON 1, W. VA. **Telephone Charleston 33-615**

Pittsburgh Representative: **JOHN W. PATTERSON CO.**
Rook Station **Phone: Carnegie 3500** **Carnegie, Pa.**

Dippers for Any Model and All Makes of Shovels • Manganese Drag Chains • Dump Blocks and Shackles
HAZARD WIRE ROPE

IT'S IN THE Bag

SEAL-TITE
SAFETY SEAM
TAMPING BAGS

● What's in a tamping bag is what counts.

That's why SEAL-TITE Tamping Bags are your answer—they are built for your service so that you get a safer, faster, cheaper method of sealing shots.

Safety is built in because of the SEAL-TITE Safety Seam feature which prevents these bags from splitting or breaking as a result of moisture. You use less explosive thus avoiding shattering, heavy blasts which endanger mine roof and working structures.

There's economy in this bag too—it's made of 100% genuine sulphate kraft. That means greater strength and durability.

You reduce the number of charges—it means time savings. You increase the effectiveness of every charge.

Why not investigate today? Write to us and get all the details. Once you use SEAL-TITE Safety Seam Tamping Bags you'll see why so many operators prefer them and depend on them for best results. They can be supplied in any width—any desired length or weight of paper.

Ask about the "Dummy Maker" machine for use with SEAL-TITE Tamping Bags.

Relieves worry . . . assures better, safer working conditions . . . convenient . . . dependable . . . inexpensive . . . furnishes an ever-ready supply of safe, properly filled Dummies . . . fills and packs 400 to 600 bags per hour . . . uses clay, rock dust, or sand . . . requires only one or two skilled operators . . . operates on ¼ h.p. motor from trolley circuit . . . mounted on trucks for portability . . . pays for itself in a short time.

THE TAMPING BAG COMPANY Mount Vernon ILLINOIS